

◆.....**OBSTETRIC NURSING**.....◆

Obstetrics, branch of medicine that specializes in caring for women during pregnancy, labour, and immediately following childbirth. The term is derived from the Latin word '**obstare**', meaning "**to standby**", or '**opstare**', meaning "**to render aid**", and '**obstetrix**', meaning "**the woman who stands by**".

TERMS USED IN MIDWIFERY

1. **Alcohol Syndrome Foetalis**: A group of signs manifested in new-born babies when the mother has taken excessive amount of alcohol.
2. **Abortion**: Termination of pregnancy before the foetus is viable, thus, before 24 weeks of gestation.
3. **Abruption**: A tearing away from. Example is *Abruptio placentae*.
4. **Atresia**: Closure or absence of a usual opening or canal. *Oesophageal atresia*.
5. **Amenorrhea**: absence of menstrual periods.
6. **Autosomes**: The chromosomes not concern with sex determination.
7. **Amniotomy**: Artificial rupture of the amniotic sac.

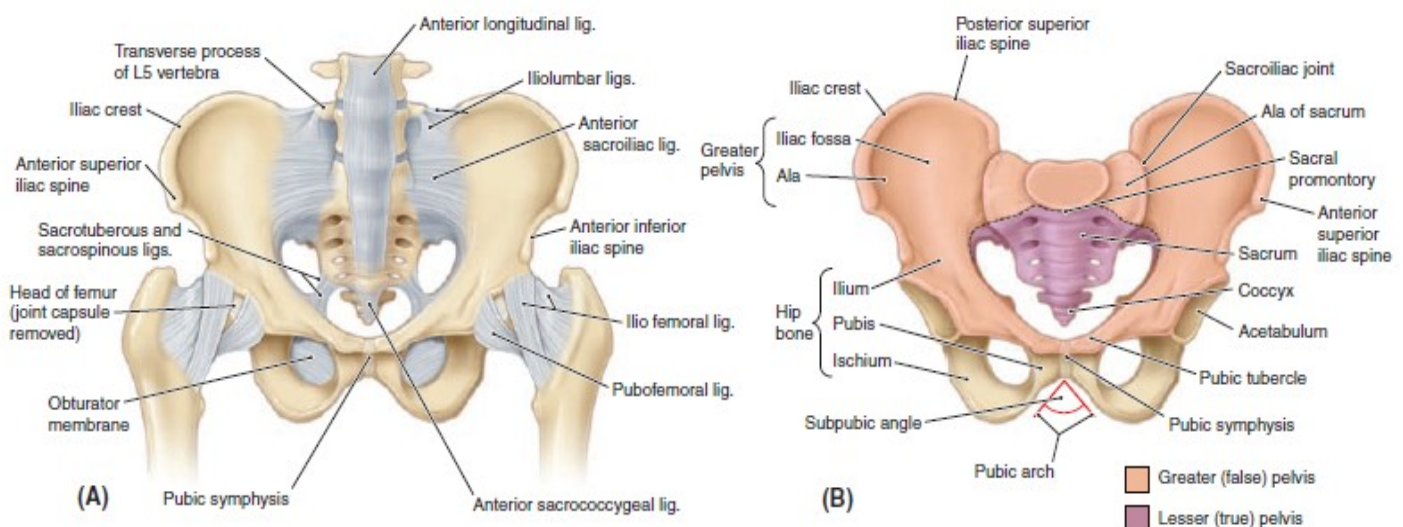
8. **Augmentation of labour**: An intervention to correct slow progress of labour.
9. **Bifida**: Cleft, divided into two. Example is *Spinabifida*.
10. **Bicornuate uterus**: A structural abnormality of the uterus.
11. **Breast pump**: An appliance used to extract milk from the breast by suction.
12. **Caul**: A cap. This is the part of the amnion which covers the baby's face when it is born with the amnion intact.
13. **Cerclage**: A non-absorbable suture inserted to keep the cervix closed.
14. **Cervicitis**: An inflammation of the cervix.
15. **Colposcopy**: Visualization of the cervix using colposcope.
16. **Climacteric**: The change of the life or menopause.
17. **Cyesis**: Pregnancy, Pseudocyesis (a phantom/false pregnancy).
18. **Dystocia**: Difficult labour.
19. **Dyspareunia**: Painful or difficult intercourse experienced by the woman.
20. **Dizygote**: Formed from two separate zygotes.
21. **Ectopic gestation**: Pregnancy outside the uterus.

- 22.**Funnis**: A cord. A term referring to the umbilical cord. Funnis scuffle.
- 23.**Gestation**: Pregnancy. Example is Ectopic gestation.
- 24.**Gravid**: Pregnant.
- 25.**Gravidarum**: Pregnant woman.
- 26.**Hermaphroditism**: An organism with both sexes present.
- 27.**Hypoxia**: Lack of oxygen.
- 28.**Lanugo**: Soft downy hair which covers the foetus in utero and sometimes in neonates.
- 29.**Lightening**: This is the sinking or setting of the foetus into the lower poles of the uterus at the 36th week of gestation, commonly seen primigravidae.
- 30.**Macrosomia**: Large baby.
- 31.**Malposition**: A presentation other than the normal well flexed anterior position of the head.
- 32.**Malpresentation**: A presentation other the vertex.
- 33.**Menarche**: First menstrual cycle.
- 34.**Multigravida**: A woman who has been pregnant more than once.
- 35.**Multi-para**: A woman who has given birth more than once.
- 36.**Nulli-para**: A woman who has not given birth to a viable baby.

- 37.**Primigravidae**: A woman pregnant for the first time.
- 38.**Primi-para**: A woman giving birth to a child for the first time whether alive or still birth.
- 39.**Presentation**: The part of the foetus in the lower pole of the uterus.
- 40.**Rectocele**: Prolapse of the rectum into the vagina.
- 41.**Recto-vaginalfistula**: An artificial opening between the rectum and vagina.
- 42.**Super-fecundation**: The fertilization of two ova during one inter-menstrual period at different acts of coitus will usually result in dizygotic twin.
- 43.**Superfetation**: The fertilization of the two ova during different inter-menstrual.
- 44.**Teratogen**: A drug or an agent believes to cause congenital abnormalities.
- 45.**Trisomy**: an additional chromosome to the normal complement to become 47 of 46.
- 46.**Effacement**: Taking up of the cervix.
- 47.**Eutocia**: Normal labour.
- 48.**Station**: Relationship of presenting part to pelvis.
- 49.**Salping sign**: Cross overlapping of foetal skull bones which denotes intra uterine death.
- 50.**Involution**: Returning to normal non pregnant size after enlargement.

51. **Vernix caseosa**: A greasy substance of the foetal skin in utero.
52. **Vertex**: An area between occiput and sinciput.
53. **S.B**: Still birth.
54. **Full dilation**: When the cervix is completely open.
55. **Galactorrhea**: Excessive flow of breast milk.
56. **Meconium**: The maternal present in the foetal intestinal tract which is passed per rectum during the few days of life.

THE ANATOMY AND PHYSIOLOGY OF THE REPRODUCTIVE SYSTEM PAEDIATRIC



The female pelvis is composed of four bones, comprising of *SACRUM*, *COCCYX* and *TWO INNOMINATE* bones. It articulates with the 5th lumbar vertebrae above and with the heads of the left (L) & right (R) femur in the corresponding acetabulum. The weight of the trunk is transmitted to the legs through the pelvis. The shape of the pelvis is like of a basin which provides protection to pelvic organs and it is the largest bone formation in the body.

The pelvis is composed of the following bones:

- *The Sacrum*
- *The Coccyx*
- *The two innominate bones*

SACRUM: Is triangular in shape and is formed by the fusion of five sacral vertebrae with the Apex pointing downwards and lies like a wedge between the two innominate bones. Four pairs of foraminae are formed where the vertebrae fuse and these communicate with the sacral canal. These serve as passage for nerves, blood and lymphatic vessels. The sacrum forms the posterior wall of the pelvic cavity. The anterior concave surface is known as *THE HOLLOW OF THE SACRUM*, whilst the widened out wings of bone on each side of the first sacral vertebra which, with the base of the 5th lumbar vertebra, protrudes over the hollow of the sacrum.

COCCYX: This consists of or is made up of four fused vertebrae bones which is triangular in shape with its base lying uppermost and articulating with the sacrum.

THE INNOMINATE BONE

Each innominate bone is composed of three parts. These three parts are the *ILIUM*, *ISCHIUM* and

PUBIS. They meet in the cup-shaped depression which is known as the *ACETABULUM*.

THE ILIUM: It is the flared out part which can easily be palpated if the hands are placed on the hips. It is surmounted by the *ILIAC CREST*. The crest terminates anteriorly in the *ANTERIOR SUPERIOR ILIAC SPINE*. Approximately 2.5cm below it lies the *ANTERIOR INFERIOR ILIAC SPINE*, similarly, the crest terminates posteriorly in the *POSTERIOR SUPERIOR ILIAC SPINE* just below is the *POSTERIOR INFERIOR ILIAC SPINE* which also marks the upper border of the *GREATER SCIATIC NOTCH* through which the *SCIATIC NERVE* passes. It also forms two-fifth of the acetabulum. The inner surface is smooth while the outer is rough for possible attachment of muscles.

THE ISCHIUM: It's the lower thick portion of the innominate bone and forms lower two-fifths of the acetabulum. The *ISCHIAL TUBEROSITY* is the thickened area of the bone, which forms the body

of the ischium, this is where the body rest when sitting. The ischial spine has approximately 2.5cm above the ischial tuberosity and divides the greater and lesser sciatic notches.

THE PUBIS: It's the smallest of the innominate bone and forms the lower one-fifth of the acetabulum. The right (R) and left (L) pubic bones unite with each other's anteriorly at the square-shaped pubic bodies. They are fused by a cartilage known as the *SYMPHYSIS PUBIS*. Extending upwards from each pubic body is the *SUPERIOR RAMUS* which unites with the ilium at the *ILIOPECTINEAL EMINENCE*, while the inferior ramus extends down-wards to unite with the ischium. The right and left inferior rami form the *PUBIC ARCH*.

PELVIC JOINTS

- 1. Two Sacro-iliac joint*
- 2. The symphysis pubis*
- 3. The Sacro-coccygeus joint*

These bones join the pelvis together. They are the four most important joints of the pelvis.

The other joints are:

- 1. The hip joint*
- 2. The lumbar-sacral joint*

THE TWO SACRO-ILIAC JOINTS

They are the slightly movable joints between the sacrum and the ilium on each side. There are cartilages between these joints.

THE SYMPHYSIS PUBIS

This is a secondary cartilaginous joint and is formed between the lower border of sacrum and the upper border of the coccyx.

In the non-pregnant state, there is little movement in these joints. During pregnancy, considerable amount of relaxation takes place in them because the ligaments are softened and they also stretch as a result of hormonal action. Those hormones produce a change which results in slight separation of the joints. This is referred to as '*GIVE*' of the

pelvis. The hormones involved are *PROGESTERONE* and *RELAXIN*. It increases slightly the size of the pelvis allowing the passage foetal head in case of minor degree of disproportion. It causes backache among most pregnant women.

THE PELVIC LIGAMENTS

The joints of the pelvis are bound together by ligaments. These are:

1. **Sacro-iliac ligaments:** These bind sacrum and the ilium together at the sacro-iliac joint. They lie interiorly, posterior and superiorly over the joint.
2. **Pubic ligaments/inter-pubic ligaments:** This strengthens the symphysis pubis. They are found in front, above, below and back of the pad cartilage.
3. **Sacro-tuberos ligaments:** These are two large strong ligaments which pass from the back of the sacrum to the ischial tuberosities.
4. **Sacro-coccygeal ligaments:** These support the sacro-coccygeus joint. They are found in front, behind and at the sides of the joints.

OTHER LIGAMENTS

1. **Pouparts/inguinal ligaments:** This extends between the anterior superior iliac spine and the body of the pubis.
2. **Gimbernats or lucuner ligaments:** These are small ligaments which occupy the angles between the inner ends of the inguinal ligaments and the upper parts of the pubic bones.
3. **The Obturator membrane:** This is a ligament which covers the obturator foramen with the exception of a small hole in the upper parts for the passage of the obturator nerves, blood vessels and lymph vessels.

DIVISIONS OF THE PELVIS

For obstetrical purposes, the pelvis is divided into two parts by the pelvic brim into:

1. *The False pelvis*
2. *The True pelvis*

The False pelvis: This is the part of the pelvis situated above the pelvic brim, it is formed by the upper flared-out portion of the iliac bones and protects the abdominal organs. However, the false pelvis has no significance in midwifery.

The True pelvis: This is the bony canal through which the foetus must pass during birth. It is formed by the two pubic bones in front, two ischial bones at the side, sacrum and coccyx at the back. It is divided into a *BRIM*, *CAVITY* and an *OUTLET*. The true pelvis is very important in Midwifery.

THE THREE DIVISIONS OF THE TRUE PELVIS:

1. *The brim*
2. *The cavity*
3. *The outlet*

The Brim: The Superior circumference forms the brim of the true pelvis, the included space being called the inlet. It separates the false pelvis from the true pelvis. The brim is round except where the promontory of the sacrum projects into it. It is bounded by these structures known as Landmarks.

- 1. The promontory of sacrum*
- 2. The alae or wings of the sacrum*
- 3. The sacro-iliac joint*
- 4. The ilio-pectineal line*
- 5. The ilio-pectineal eminence*
- 6. The upper inner border of the superior pubic ramus*
- 7. The body of the pubic bone*
- 8. The upper inner border of the symphysis pubis*

The Cavity: The cavity extends from the brim of the pelvis outlet below. It is formed by the hollow of the sacrum; the posterior wall is deeply concave and is approximately 10cm in length. The anterior wall is formed by the symphysis pubis and approximately 4cm long. The lateral walls are formed by imaginary lines drawn across.

The Outlet: This is the lower circumference of the true pelvis. The obstetrical outlet is of greater practical significance because it includes the narrow pelvis strait through which the foetus must pass.

The landmarks are:

- 1. The lower border of the symphysis pubic*
- 2. The ischial spines*
- 3. The sacro-spinuous ligament*

4. The lower border of the sacrum

PELVIC DIAMETERS

Knowledge of the pelvic diameters of the normal female pelvis is important because contraction of any of them can result in malposition or malpresentation of the presenting part of the foetus.

DIAMETRES OF THE BRIM

The brim has three principal diameters, the antero-posterior diameter, oblique diameter and transverse diameter.

1. **The antero-posterior diameter:** This is measured from the sacral promontory to the upper inner border of the symphysis pubis, it measures 11cm in the normal female pelvis.
2. **The oblique diameter:** Is the distance between the sacra-iliac joint and the opposite ilio-pectineal eminence. It should not be less than 12cm. there are two oblique diameters.

3. **Transverse diameter:** Is a line between the points furthest apart on the ilio-pectineal lines and measures 13cm.

Diameters of the cavity

The cavity is round, so all the diameters are the same and each measures 12cm.

1. **Antero-posterior diameter:** This is measured from the junction of the second and third sacral vertebrae/ middle of the hollow of the sacrum to the mid-point of the symphysis pubis.
2. **Transverse diameter:** Is a measurement taken between the two points furthest apart on the lateral pelvic walls.
3. **The oblique:** Runs parallel to the oblique diameters of the pelvic brim.

Diameters of the outlet

1. **Antero-posteriordiameter:** This is measured from the lower border of the symphysis to the

lower border of the sacrum. It is approximately 13cm long.

2. **Oblique diameter**: This measures 12cm taken from the inner of the pubic arch to the sacro-tuberous ligaments on the opposite side.

3. **Transverse diameter**: This is estimated between either the two ischial tuberosity or the two ischial spines. Both measurements are the same in the normal pelvis. The minimum measurement is 11cm.

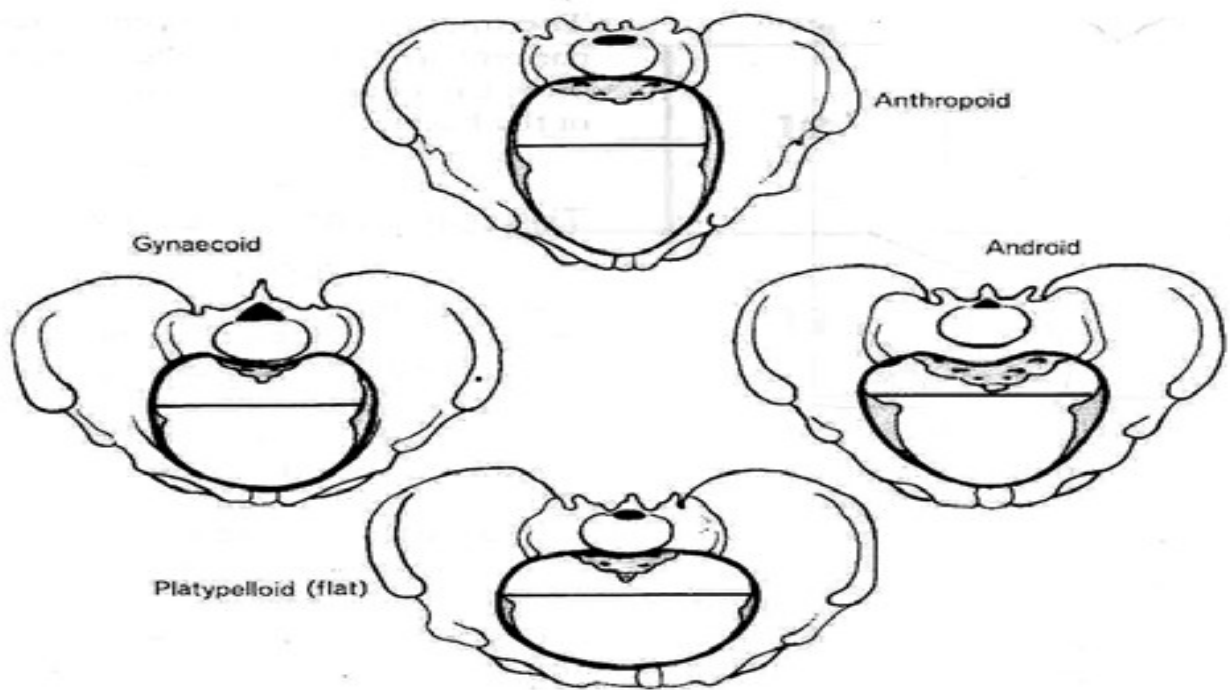
Pelvic division	Antero-posterior	Oblique	Transverse
Brim	11	12	13
Cavity	12	12	12
Outlet	13	12	11

TYPES OF PELVIS

The size of the pelvis varies not only in the two sexes, but also in different members of the same

sex. Four main types of pelvis have been described by Caldwell and Molley. These are

1. *Gynaecoid (Normal)*
2. *Android (Male type)*
3. *Anthropoid (Ape-like)*
4. *Platypelloid (Kidney shaped/flat pelvis)*



Gynaecoid pelvis

This is another name for the normal female pelvis and is found in about 50% of all women. It is suitable for child birth.

Characteristics

- ❖ Has light bones with a wide transverse diameter
- ❖ Has a generous fore-pelvis
- ❖ Has straight side walls
- ❖ It has round brim
- ❖ Has a shallow cavity and a well curved sacrum
- ❖ The sub-pubis arch is 90°
- ❖ Has a round sciatic notch
- ❖ Has a wide outlet

Effects on labour

It favours the anterior posterior diameter of the vertex presentation and mechanism of labour is normal.

Android pelvis

This type of pelvis resembles the male pelvis. It is found in 20% of women. It is common in short and heavily built women with men features.

Characteristics

- ❖ The bones are heavy, waged
- ❖ Heart shaped brim
- ❖ The sacrum is straight
- ❖ The sacral promontory is flat
- ❖ Has converging side walls
- ❖ Has a deep cavity
- ❖ The sub-pubic arch is less than 90°
- ❖ Has a narrow fore pelvis
- ❖ Has prominent ischial spines, which may reduce the diameter
- ❖ The diameter conjugate is too narrow to accommodate the foetal head
- ❖ The transverse diameter is greater than the true conjugated by 2.5cm

Effects on labour

1. It favours the posterior position of the vertex ending in persistent occipito-posterior position

or deep transverse arrest. The bi-parietal diameters are more easily accommodated. In about 90% of such positions though, labour tends to prolong, delivery may be normal but episiotomy may be necessary during vaginal delivery.

2. Also, forceps deliveries and lacerations of pelvic floor and perineum should be highly anticipated.

Features of women with android pelvis

1. The women are usually short, heavy with broad shoulders and deep voices.
2. They have male distribution of hair.
3. History of infertility.

Anthropoid or Ape-like pelvis

This type of pelvis is found in women who tend to be tall and have narrow shoulders. It's common in about 25% of women.

Characteristics

- 1.The bones are long
- 2.The brim is oval in shape
- 3.The sacrum is long and deeply concave
- 4.Has blunt ischial spines
- 5.Has diverging side walls
- 6.Has a deep cavity
- 7.The antero-posterior diameter is longer than the transverse diameter
- 8.The sub-pubic arch is very wide
- 9.The diameter of the outlet is adequate.

Effects on labour

- 1.Labour is easy – because the foetus present with the long diameter of the head in the antero-posterior diameter of the pelvic brim.
- 2.The woman can have post-partum haemorrhage.

Platypelloid or Simple Pelvis

This is a flat type of pelvis with kidney shape brim.
This may be due to hereditary factors or

developmental rachitics. It is often seen in African women possibly due to poor dietary or the custom of carrying heavy weights on the head during the developmental years.

Characteristics

- The brim is kidney shaped
- The cavity is shallow
- The antero-posterior diameter is short and transverse diameter long
- The sacrum is flat
- Has blunt ischial spines
- Coccyx turns shapely forward
- The sub-pubic angle is very wide
- Has diverging side walls

Effects on labour

1. Foetus presents with head in the transverse diameter if baby is small, it can descend through the brim but there is usually a deep transverse arrest and in case of big baby there is disproportion.

- 2.If head extends in labour face presentation may results. And if the brim is much contracted caesarean section is the best option.
- 3.Engagement may necessitate lateral tilting of the head known as *ASYNCLITISM* in order to allow the bi-parietal diameter to pass the narrowest AP diameter of the brim.

NOTE: *A contracted pelvis is the one in which one or more essential diameters of it are reduced by 1cm.*

Other types of pelvis:

- 1.Rachitic pelvis*
- 2.Justo-minor pelvis*
- 3.Naegel's obliquity*
- 4.Roberts pelvis*

THE PELVIC THE FLOOR

The pelvic floor is formed by soft tissue that fills the pelvic outlet, support the pelvic organs and protect the abdominal organs. It is important to note that the hygiene, comfort and social well-being of a woman depends on the effectiveness of their muscle tone. In the female, the muscles are

pierced by three orifices; The Vagina, The Urethra and The Anus.

LAYERS OF THE PELVIC FLOOR MUSCLES

The muscles are arranged in two layers

- *Deep pelvic floor muscles*
- *Superficial pelvic floor muscles*

DEEP PELVIC FLOOR MUSCLES / LEVATOR ANI MUSCLES

These are three strong muscles found on each side of the pelvis. They each have their insertion around the coccyx and are therefore sometimes called the *COCCYGEAL MUSCLES*. These muscles are of vital importance in the voluntary control of the bladder and the bowel.

There are three pairs of muscles that make up the pelvic floor muscles:

1. *Ilio-coccygeus muscles*
2. *Ischio-occygeus muscles*

3. Pubo-coccygeus muscles

THE ILLIO-COCYGEUS MUSCLE

They are two in number; they arise from the white line of the fascia on the inner aspect of each iliac bone and from each ischial spines and runs posteriorly to the coccyx. Fibres from left and right meet midline with other fibres to form the anal sphincter and the perineal muscle.

NOTE: *During defecation, these 2 muscle layers lift the anus and they are called the levator ani.*

THE ISCHIO-COCYGEUS MUSCLE

They are also two in number and arising from each ischial spines, pass downwards and inwards to be inserted into the upper part of the coccyx and the lower border of the sacrum.

THE PUBO-COCYGEUS MUSCLES

They are three in number and arise from inner border of the pubic bones of the coccyx. The muscle fibres sweep posteriorly below the bladder and surround the urethra, vagina and the rectum. They meet at the perineal body. Some of the fibres are inserted into the coccyx.

SUPERFICIAL PELVIC FLOOR MUSCLES

These muscles lie under the deep muscles. These muscles are if less important but they provide additional support to the deep muscles. They are liable to injury during childbirth.

This muscle is composed of five muscles

- *Bulbo-cavernosus muscle*
- *Ischio-cavernosus muscle*
- *Transverse perineal*
- *External anal sphincter*
- *Membranous sphincter of the urethra*

Bulbo-cavernosus muscle: They are two and surround the vagina orifice superficially as well as the Bartholins gland. They pass from the perineum

forward around the vagina to the corpora cavernosa of the clitoris just under the pubic arch. They engorge the clitoris and diminish the size of the vagina.

Ischio-cavernosus muscle: They pass from the ischial tuberosities upwards and inwards along the pubic arch to be inserted into corpora cavernosa of the clitoris.

Transverse perineal muscle: They pass from the ischial tuberosities to the center of the perineum.

External anal sphincter: They surround the anus. They also form the perineal body where it is attached to muscle fibers. They close the lumen of the anal canal.

Membranous sphincter of the urethra: This is composed of muscles passing below and above the urethra and attached to the pubic bone. Since it is not circular, it is not a true sphincter but it closes the urethra.

FUNCTIONS OF THE PELVIC FLOOR MUSCLE

- The muscles provides support for the pelvic organs and abdominal organs
- It also maintains continence as part of the urinary and anal sphincter
- It also plays an important part in sexual intercourse
- It helps in the passive movement of the child during child birth
- It resist pressure during coughing, laughing and sneezing
- It closes the pelvic outlet in a non-pregnant stage

THE PERINEAL BODY

It is triangular or wedge shaped and measured about 4cm on each side. It lies between the anus and the vagina and its apex directed upwards.

PERINEAL TRAUMA

1. Over stretching. Example is prolonged labour
2. Oedema
3. Tears of the perineum and perineal body. This is divided into degrees:
 - a) First degree: Only the fourchette and perineal skin are involved.
 - b) Second degree: Involves the skin, superficial pelvic floor muscles and sometimes the labia and the vaginal walls.
 - c) Third degree: This involves the deep pelvic floor muscles and can sometimes extend to the external anal sphincter.
 - d) Fourth degree: In this type, the tear extends to the anterior wall of the rectum and to the internal anal sphincter.

Causes of perineal tears

- Extremely large babies.
- Allowing the largest diameter of the fetal head to extend to the vulva and the outlet as occurs during the deflexed head delivery.
- Delivery of head at the height of contractions.

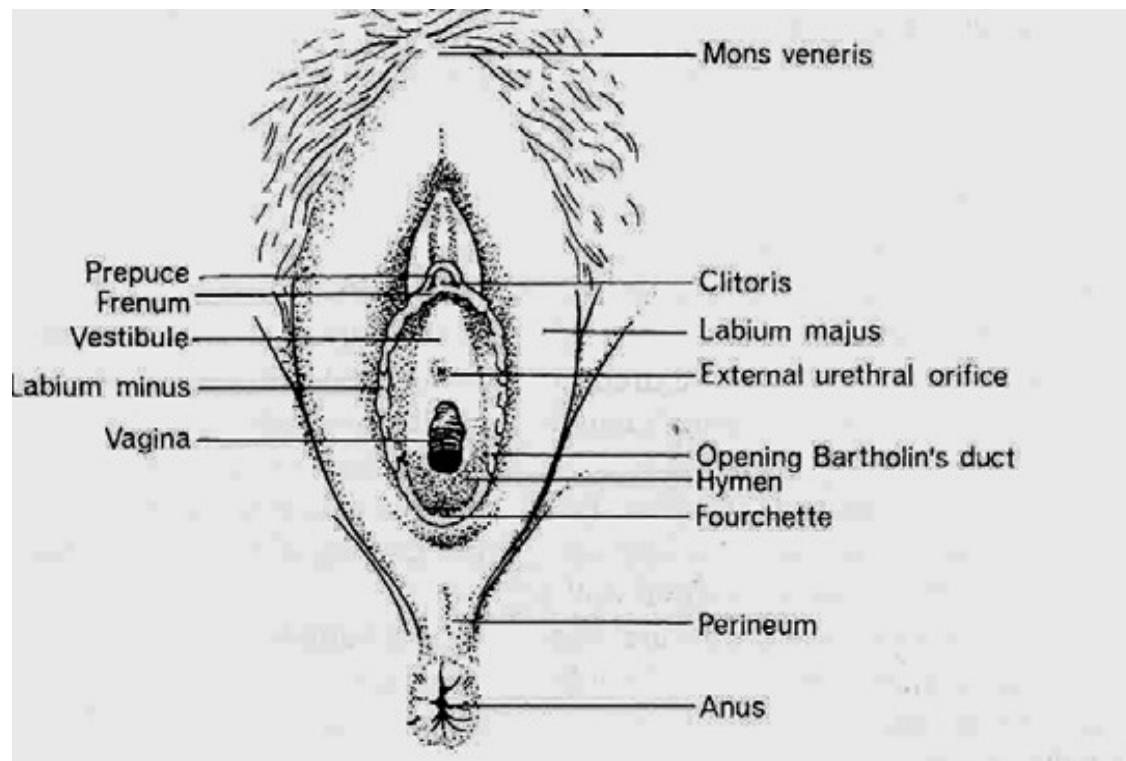
- When there is narrow pelvic arch.

Prevention of tears

- Timely delivery
- General health should be improved
- Exercises
- Assessment of pelvic floor tone
- Education on special techniques to carry out through the first to the second stage of labour.

NOTE: *Treatment is via suturing.*

FEMALE REPRODUCTIVE ORGANS



The female genital tract includes the external genitalia collectively called VULVA and the internal genitalia namely the vagina, the uterus, the uterine/fallopian tubes and the ovaries.

VULVA: The term vulva applies to the external female genital organs. It consists of the following structures:

- **Mons-veneris/pubis**: This is a pad of fat lying over the symphysis pubis. It is covered with pubic hair from the time of puberty.

- **Labia majora**: These are two large folds of fatty tissue covered with skin and pubic hair on the outer surface. They arise in the Mons-veneris and merge into the perineum behind.
- **Labia minora**: These are two small folds of skin lying between the labia majora. Anteriorly, they divide to enclose the clitoris. Posteriorly, they fuse to form the fourchette and frenum is formed by their two medial parts.
- **Clitoris**: This is a small rudimentary organ compared to the male penis. It is extremely sensitive and highly vascular and plays a part in the organ of sexual intercourse.
- **Vestibule**: This is the area enclosed by the labia minora in which are situated the opening of the urethra and the vagina, in order to observe the vestibule, the folds of the labia must be separated. There are six openings into it: The *Urethra meatus*, *vaginal orifices*, *two skene's duct* and *two Bartholins duct*.

URETHRAL ORIFICE: This lies 2.5cm posteriorly to the clitoris. On either side lie the openings of the skene's ducts two small blind-ended tubules 0.5cm long running within the urethral walls.

VAGINAL ORIFICES: Also known as *INTROITUS* of the vagina. It occupies the posterior third of the vestibule; it is partly closed by the hymen.

BARTHOLINS GLANDS: These are two small glands that open on either side of the vaginal orifice and lie in the posterior part of the labia majora. They secrete mucus which lubricates the vaginal opening.

PREPUCE: The lateral portion of the labia minora unites above the clitoris to form the prepuce.

FRENULUM/FRENUM: The medial portion of the labia minora unites below the clitoris to form the frenulum.

FOURCHETTE: This is a thin fold of skin formed where the labia minora meets posteriorly.

PERINEUM: Is an area of skin extending from the fourchette to the anus.

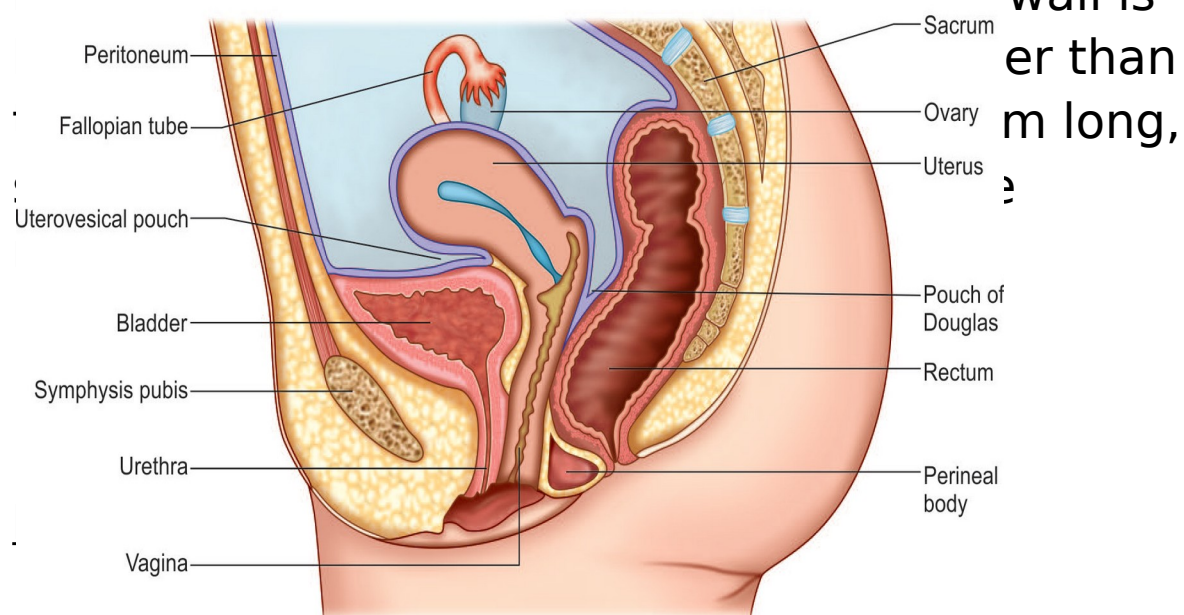
BLOOD SUPPLY: Is via external and internal pudendal arteries which branch from the femoral arteries. Venous drainage is by external and internal pudendal veins.

LYMPHATIC DRAINAGE: Inguinal gland.

NERVE SUPPLY: Pudendal nerve.

VAGINA

The vagina is a potential canal which extends from the vulva to the uterus. It runs upwards and backwards parallel to the pelvic brim. The walls are normally lying in close contact with each other but becoming only separated. The posterior wall is



- ✓ ***Passage of menstrual flow***
- ✓ ***Receives the penis and sperms***
- ✓ ***Provides exit for the fetus***
- ✓ ***Helps support the uterus***
- ✓ ***Helps to prevent infection***

Macroscopic Structure: The lining of the vagina looks pinkish when seen with the naked eye and is in folds or rugae, these rugae allows for stretching during child birth.

Microscopic Structure: The walls of the vagina are made up of four coats from within outwards; they are:

1. Squamous epithelium which is similar to the skin
2. Vascular connective tissue
3. Muscle coat arranged in two layer of involuntary muscle fibre
 - a) Weak inner circular fibres
 - b) Strong outer longitudinal fibres
4. Pelvic fascia made up of loose connective tissues which allows for expansion of vagina and other adjacent organs.

STRUCTURE IN RELATION TO THE VAGINA

Knowledge of the relations of the vagina to other organs is essential for the accurate examination of the pregnant woman and her safe delivery.

Anteriorly: The bladder and urethra

Posteriorly: Behind the vagina lies the Pouch of Douglas, the rectum and the perineal body each occupying approximately one third of the posterior vaginal wall.

Superiorly: Above the vagina is the uterus.

Inferiorly: Below the vagina lie the external genitalia.

Laterally: The pelvic fascia and ureters, and pubo-coccygeus muscle.

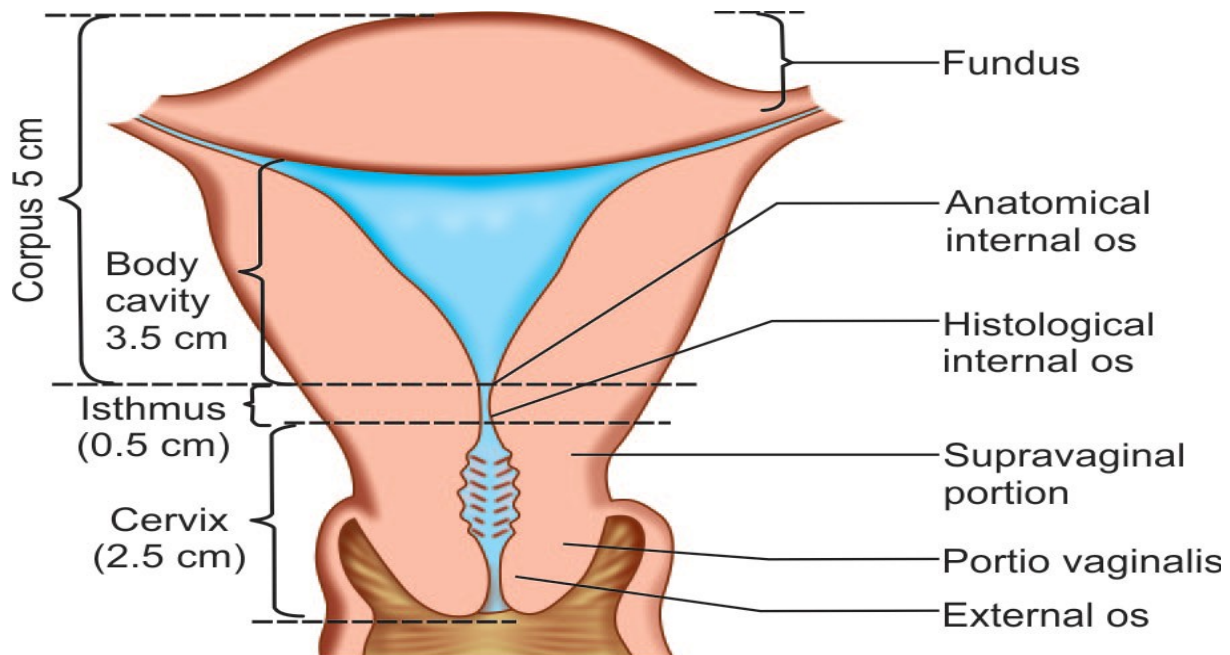
Lymphatic drainage: Into inguinal, internal iliac and sacral glands.

Nerve supply: Is from the pelvic plexus.

BLOOD SUPPLY TO THE VAGINA	VENUS RETURN
Uterine arteries Vaginal artery Haemorrhoidal Artery Internal Pudendal artery Inferior vesical artery All these are branches of the internal iliac artery	Uterine vein Vaginal vein Haemorrhoidal vein Internal pudendal vein Inferior vesical vein All finally drainage into the internal iliac vein

THE UTERUS

The uterus is a hollow muscular organ that lies in the true pelvis in ante-verted and ante-flexed position. It has the bladder in front and the rectum behind. It receives the insertion of the uterine tubes at its upper and outer ends. The shape of the non-pregnant uterus resembles that of an English pear. It is 7.5 cm long and 2.5 cm thick and 5 cm wide. It weighs approximately 60g.



THE GROSS STRUCTURE OF THE UTERUS

The cornua: This is where the uterine tubes insert and opens into the uterine cavity.

The fundus: The fundus is the domed upper wall between the insertions of the uterine tubes.

The corpus/body: This is the portion that lies between the cervix and the fundus. It forms the upper two-thirds of the uterus.

The cavity: It is the triangular shaped potential space that lies in the centre of the uterus. Its base directed upper most and the apex is towards the cervix.

The Isthmus: This is the constricted part that lies between the body of the uterus and the cervix. It is about 7 mm long.

The cervix: This forms the lower third of the uterus and shall be discussed in details later.

MICROSCOPIC STRUCTURE OF THE UTERUS

Endometrium: This is the inner lining of the uterus. It is composed of numerous glands secreting mucus. During menstruation, it is shed as far as the basal layer. Its appearance varies with each day of the menstrual-cycle.

Myometrium: This is the muscle layer which makes up the chief bulk of the uterus during active sexual life. It is composed of plain muscles arranged in all direction. The muscle fibres are interlaced with each other in the non-pregnant state and become well defined in pregnancy. They are:

- **Inner circular layer**: Mostly distributed around the cervix and cornea.

- **The middle layer**: Is the interlacing oblique fibres that runs like a finger of eight around the blood vessels and lymphatic vessels.
- **Outer longitudinal layer**: This runs from the internal OS in front over the fundus and down to the internal OS.

Perimetrium: It covers the uterus quite smoothly and almost entirely posterior up to the cervix where it forms the *recto vaginal pouch* or *pouch of Douglas*. It does not cover bladder expansion.

Blood supply

- 1) Right and left ovarian arteries from the abdominal aorta
- 2) Uterine arteries

Venous drainage: Ovarian vein

Lymphatic drainage: Internal iliac and sacral glands

Nerve supply: Sympathetic and parasympathetic via the inferior hypogastric or pelvic plexus.

RELATIONS OF THE UTERUS

Anteriorly: Intestines above the bladder and in front of the body of the uterus

Posteriorly: Rectum, pouch of Douglas and utero-sacral ligaments

Laterally: The fallopian tubes, ovarian ligaments, blood vessels, lymphatic vessels and nerves.

Inferiorly: Vagina

FUNCTIONS OF THE UTERUS

- 1. To prepare a bed for the fertilized ovum***
- 2. To nourish the fertilized ovum***
- 3. To expel the product of conception***
- 4. To involute following child birth***

THE CERVIX

The cervix forms the lower third of the uterus and is the area below the isthmus which includes the internal OS and external OS. It enters the vagina at

right angles and is sometimes called the neck of the uterus. The cervical canal is in fusiform shape, while the entire cervix is a barrel-shape. The size of the cervix in an adult's life is 2.5cm long and as stated earlier, it forms one third of the total length of the uterus.

GROSS STRUCTURE

The Supra-vaginal cervix: This is the portion of the cervix which lies outside and above the vagina, superiorly; it meets with the uterus at the isthmus.

The Intra-vaginal cervix: This is the portion that project into the vagina.

The Internal OS: This opens into the cavity of the uterus although not a sphincter, it dilates during labour.

The External OS: Opens into the vagina at the lower end of the cervical canal. On pelvic

examination, it is found at the level of the upper border of the symphysis pubis.

The cervical canal: The area lies between the internal and external OS.

MICROSCOPIC STRUCTURE

There are three layers of tissues:

1. **Endometrium:** Is the inner layers which contain racemose (bunch grapes like) glands. Some of which are ciliated to facilitate the passage of spermatozoa. The tissue is arranged in folds known as the ***arbor vitae***. The folds allows for dilatation of the cervix without injury. In the Multigravida mother, the arbor vitae become flattened out with successive pregnancies.
2. **Muscle:** This is composed of involuntary muscle fibres just like in the uterus.

3. **Peritoneum**: Covers that part of cervix which lies above the vagina. It is loosely applied in the area where it reflects up and over the bladder. The intra-vaginal cervix has an outer coat of stratified epitheliums which is continuous with the vagina lining. It continues a short distance into the cervical canal to meet cervical Endometrium at the ***squamocolumnar junction***, the commonest site of cervical cancer

NOTE: *Blood supply, lymphatic drainage and nerve supply are same as the uterus.*

FUNCTIONS OF THE CERVIX

- Prevents infection from entering the uterus
- It dilates and withdraws during labour to allow for childbirth and placenta.
- Following delivery, it involutes (return to almost it's non-pregnant state).

THE UTERINE TUBES

The uterine tubes, also known as oviducts of fallopian tubes are the female structures that transport the ova from the ovary to the uterus each month. These are two narrow muscular tubes that insert at the cornua of the uterus, direct towards the side walls of the pelvis, then turn downwards and backwards to reach the ovaries. They lie within the broad ligament. The tubes communicate with the cavity of the uterus at its proximal end and the peritoneal cavity, at its distal end. The length of each tube is about 10cm and the diameter varies in each part, interstitial 1mm wide/1.25cm long.

1. Isthmus is 2.5cm long

2. Ampulla is 5cm long

GROSS STRUCTURE

The Interstitial portion: It lies within the wall of the uterus and measures 1.25cm in length.

The Isthmus: Is the narrowest portion of the tube and act as a receiver for spermatozoa, it is also about 2.5cm long and is under the control of hormones.

The Ampulla: This is the wider and longer portion of the tubes. It measures 5cm long and 1.2mm wide. It is the normal site for fertilization.

The Infundibulum/Fimbriated end: This is the terminal part of the tube, composed of many finger like projections known as **fimbriae**. One of the fimbriae is in close contact with the ovary and is known as the **fimbriae ovarica/ovariae**.

MICROSCOPIC STRUCTURE

1. An outer coat of peritoneum which covers the top and the sides but absent on their inferior parts.
2. The muscle coat: This consists of two layers; an inner circular layer and an outer longitudinal layer. Both are smooth. The peristaltic movements of the uterine tubes are due to the action of these muscles.
3. The sub-mucous layer of the connective tissue
4. The inner coat of ciliated epithelium, it is thrown into folds known as **PLICAE**. These

folds slow the ovum down on its way to the uterus. The lining or goblet cells that produce a secretion containing glycogen to nourish the fertilized ovum.

Blood supply: This uterine and ovarian arteries. Returning via the corresponding veins.

Lymphatic drainage: Lumbar glands and ovarian plexus respectively.

FUNCTION OF THE UTERINE TUBES

1. Provides the site for fertilization.
2. Propels the fertilized ovum into the uterus.
3. It forms a path way for the spermatozoa and ovum.
4. Nourishes the fertilized ovum on its way to the uterus.

THE OVARIES

They are two whitish rounded but flattened organs like the broad bean. They lie on either side of the uterus at the posterior part of the broad ligament. They are attached to the broad ligament by the ***Mesovarium***. They come into contact with the uterine tubes by the fimbriae ovarica. They are also into contact with the lower end of the uterus by the ovarian ligament. Through the infandibulo-pelvic ligament they get attached to the outer end of the pelvic wall.

STRUCTURE

- A. **THE HILUM**: This lies where the ovary is attached to the broad ligament and it is the point of entry of blood vessels, nerves and lymphatic vessels.

- B. **THE MEDULLA**: This is the support framework which is made of fibrous tissue, blood vessels, nerves and lymphatic travels through it.

C. **THE CORTEX**: This is the functioning part of the ovary. It contains the ovarian follicles in different stages of development. It is surrounded by stroma cells. The outer layer is formed of fibrous tissues known as the *TUNICA ALBUGINEA*. Over this lies the germinal epithelium which is a modification of the peritoneum.

Blood supply: Ovarian arteries and drains via ovarian veins.

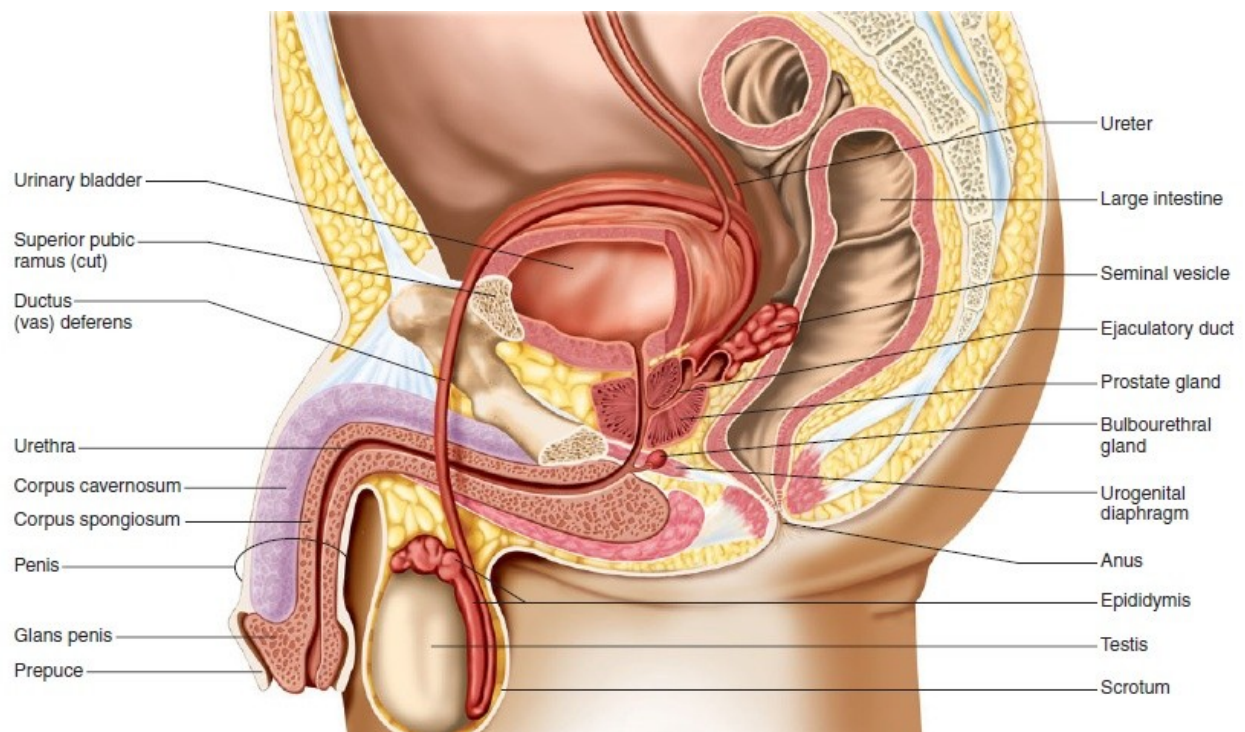
Lymphatic drainage: Lumbar glands.

Nerve supply: Ovarian plexus.

FUNCTIONS

- Production of ova and hormones (oestrogen and progesterone).

MALE REPRODUCTIVE ORGANS



The organs of the male reproductive tract are derived from the same embryonic tissues as those of the female. Like the female reproductive system, the male has both internal and external organs. The external organs are the scrotum and the penis and the internal organs are the prostate glands and tubes which links the system together.

THE SCROTUM

This is a pouch-like sac, covered with skin from the penis is suspended and is divided by fibrous

septum into two cavities, each of which contains a testis, the epididymis and the initial portion of the vasa-deferens. The scrotum positions the testes outside the body in a temperature of about 3°C lower than that of the body. The following two muscles help maintain this temperature if the external environment gets too cold.

Dartos muscle: It is located in the superficial fascia of the scrotum and septum. Contraction of these muscles creates wrinkles in the scrotal skin, the wrinkles thicken the skin reducing heat loss when external temperature is too cold.

Cremaster muscles: These are skeletal muscles extending from the internal oblique muscles to the scrotum. When the external temperature is too cold they contract to lift the scrotum closer to the body.

FUNCTIONS OF THE SCROTUM

- It serves as a pouch in which the testes are suspended outside the body.
- It protects the sperms by keeping them in a low temperature of 34.4°C as compare to that of the body.

THE PENIS

The penis hangs flaccidly downwards in front of the scrotal sac. It has a root/base that attaches it to the perineum, a body (shaft) that makes the bulk of the penis and expanded at the distal end to form an acorn-shaped structure called the

GLANSPENIS. The skin covering the glans penis is double back on itself to form the **PREPUCE** or **FORE-SKIN**. It is this fold of skin which is taken off during the operation of circumcision. The penis transmits a portion of the urethra which acts a passage for semen as well as urine. Internally, the penis consists of three masses of tissues which function as erectile tissues. These are:

- Two corpora cavernosa: These fill most of the volume of the penis.

- A single corpora spongiosum: It encloses the urethra and expands at the end to form the glans penis.

FUNCTIONS OF THE PENIS

- It carries the urethra which is a passage for both urine and semen.
- It stiffens (erection) during sexual excitement in order to be able to penetrate the vagina and deposit sperms at cervix.

THE PROSTATE GLAND

This is a cone-shaped structure with a length of 4cm, 3cm wide, cm deep and weighs about 8g. It surrounds the upper part of the urethra and lies in direct contact with the neck of the bladder. It is composed of glandular tissue, involuntary muscle fibres and enclosed in a fibrous capsule. The muscle tissue of the gland aids in ejaculation. The prostate gland produces a fluid of about 1ml each day with a pH of 6.6 and is composed of

cholesterol, citric acid and the enzyme ***hyaluronidase*** which is excreted in the urine and is also added to the sperm and seminal fluid as they fluid as they pass into the urethra.

FUNCTION OF THE PROSTATE GLAND

- It produces a thin lubricating fluid which is added to the sperm and seminal fluid as they pass through the urethra.

THE TESTES AND TUBES

The testes (testicles) are oval shaped structures, white in colour with each testis weighing about 2.5g, 5cm long and 3cm in diameter. They are formed in the fetal abdomen about the 28th week of intrauterine life and descend into the scrotum to be supported by spermatic cord before birth. The failure of the testes to descend into the scrotum is known as ***CRYPTORCHISM***. The testes are enclosed in protective fibrous capsule called the ***TUNICA ALBUGINEA***, which divides the testes

into about 200-300 lobules, and are covered by a serous membrane called ***TUNIC VAGINALIS*** which enables each testes to move freely within its scrotal cavity and also it has an inner layer of connective tissues containing a fine network of capillaries called the ***TUNICA VASCULOSA***.

FUNCTIONS OF THE TESTES

- Production and storage of spermatozoa.
- Production of the male hormone testosterone.

THE SEMI-NIFEROUS TUBULES

This is where the production of sperm takes place; each lobules of the testis has about three of these tubules. Between the tubules are interstitial cells that secrete testosterone. The semi-niferous tubules form a system of channel that leads to the epididymis.

THE EPIDIDYMIS

This is comma-shaped, coiled tubules of about 6 metres in length which connects the testes (from the semi-niferous tubules) to the vas-deferens. It stores matured sperms after they have been produced by the testis. The epididymis is lined with ciliated epithelium which helps the sperm to migrate to the vas-deferens.

THE VAS-DEFERENTIA

These are tubes, each about 45cm in length which carries spermatozoa from the epididymis to the prostate urethra. Sperms are stored here to mature and increase their motility. The secretions of the seminal vesicle and the prostate gland helps in the passage of the sperm at this stage since the vas-deferens have no ciliated lining. The vas-deferens are the structures which is legated during vasectomy/male sterilization.

THE SEMINAL VESICLE

These are small irregular shaped sacs that lie between the bladder and the rectum. They secrete a thick, yellowish fluid which is added to form seminal fluid. They open from the seminal duct to join the vas-deferens on each side.

THE EJACULATORY DUCTS

These are formed by the union of the seminal duct and the vas-deferens. They pass through the prostate gland to the urethra thereby joining the vasa-deferentia and the urethra.

THE BULBO-URETHRAL GLAND

This is a small yellowish gland about the size of a pea lying just below the prostate gland. Their ducts are about 3cm long which opens into the urethra before it reaches the penile portion. The gland secretes fluid prior to ejaculation to facilitate the entry of the penis into the vagina. This fluid is also added to the seminal fluid.

ERECTION AND EJACULATION

During erection, parasympathetic neurons stimulate dilation of the arteries that deliver blood to the corpus cavernosa and spongiosum. As a result, blood collects in these blood vessels and causes the penis to begin to become erect. The developing erection also constricts the existing veins of the penis which causes more erection. Ejaculation occurs when the sympathetic neurons stimulate the discharge of sperm and supporting fluids from their various sources. During ejaculation, the sphincter muscle at the base of the urinary bladder contracts, preventing the passage of urine.

MENSTRUATION

It is defined as the cyclical flow of blood and shedding of the compact and functional layers of Endometrium including; mucous, enzymes and unfertilized ovum. This causes changes not only in the uterus but in the female body as a whole. The average cycle is 28 days in about 77% of women.

Each cycle last about 3-7 days. It begins at puberty known as MENARCHE and ceases at MENOPAUS.

PHASES OF THE MENSTRUAL CYCLE

Regeneration phase/Proliferation/Follicular:

This follows immediately after menstrual flow, where the anterior pituitary gland (APG) releases Follicle stimulating hormone (FSH) causing the Graafian follicle to mature. The Graafian follicles produce oestrogen causing new growth of the Endometrium. Normally, all the follicles degenerates with the exception of one that mature and raises to the surface of the ovary ready to release the ovum.

Ovulation phase: This follows immediately after the regenerative phase where the mature Graafian follicle ruptures with the aid of the hormone relaxin and the ovum released (ovulation) then oestrogen level falls. This occurs in about 14 days before the next menstrual period. The pain sometimes accompanied by pelvic pain is known as **MITTELSMERZ PAIN.**

Secretory phase: The ruptured follicle now known as the corpus luteum under the action of Luteinizing hormone (LH) also from the Anterior Pituitary Gland (APG) increase in size and begin to produce progesterone in increasing amounts this further stimulates the uterus to prepare its lining for the reception of a fertilized ovum and undergoes the following changes:

1. Endometrium becomes thicker and spongy
2. The blood supply is increased
3. Increased activities of Secretory glands
4. Deposits of mineral salt and glucose

Menstrual Phase: When fertilization fails, the ovum dies within 12-24 hours, luteinizing hormone is withdrawn after 14-15 days and the corpus luteum degenerates. All preparation for pregnancy ceases and the Endometrium are shed with menstrual flow which comprises of blood and dead tissues and this normally last for 3-7 days. Following this, the APG releases Follicle Stimulating Hormone (FSH) once again and the cycle continues.

Hormone Activity During The Menstrual Cycle

FSH = Ripens the Graafian follicle.

LH = Maintains the corpus luteum.

Prolactin = Prepares the breast for lactation.

Progesterone = Necessary physiological preparation for pregnancy.

Oestrogen = The growth of Endometrium and general female characteristics.

Relaxin = Aid the ripening and rupture of the Graafian follicle.

FERTILIZATION AND FOETAL DEVELOPMENT

This is the fusion of a sperm and an ovum to form a zygote. To fertilize an ovum (egg) the sperm releases an enzyme called Hyaluronidase which aids it to penetrate the corona radiata (the outermost layer) to get access to the zona pellucida of the ovum. The male and female gametes (sperm

and ovum) undergo changes in the Ampulla of the fallopian tube to become the zygote.

DEVELOPMENT OF THE FERTILIZED OVUM

When the ovum has been fertilized, the zygote passes through the uterine tube and reaches the uterus in about 3-5 days. The development of the zygote is divided into three periods, the first two weeks within which the zygote implants into the Endometrium is known as the ***PRE-EMBRYONIC PERIOD***, 2-8 weeks is known as the ***EMBRYONIC PERIOD*** and 8-birth is known as the ***FETAL PERIOD***. During the journey to the uterus, slow cell division takes place and the fertilized ovum divides into 2 cell, 4 cells, 8 cells, 16 cells and 32 cells and so on, until a cluster of cells is form known as the ***MORULA***. Next, a fluid filled cavity appears in the morula which becomes the ***BLASTOCYST***. Around the blastocyst is a single layer of cell known as the ***TROPHOBLAST***, and the remaining cells are clumped together at one end forming the inner cell mass. The trophoblast will form the placenta and chorion while the inner cell mass will become the fetus, amnion and the umbilical cord. On the

journey, the ovum is nourished by glycogen from the goblet cells of the uterine tubes and later the secretory glands of the uterus. Upon reaching the uterus, the blastocyst lies freely for 2-3 days before the trophoblast adheres to the Endometrium for embedding or nidation to take place. This causes implantation bleeding.

THE DECIDUA

This is the name given to the Endometrium during pregnancy. The action of oestrogen causes the increased the growth of the Endometrium to about four times of non-pregnant thickness. Progesterone from the corpus luteum also stimulates activity of the endometrial glands. The decidua is divided into three layers.

1. **The basal layer**: This lie immediately above the Myometrium. It remains unchanged in itself but regenerates the new Endometrium during puerperium.
2. **Functional layer**: This consists of large stroma cells, dilated glands and many blood

vessels. It is very soft and spongy and the blastocyst becomes embedded in it and foetal placenta is later attached to it. It is from this layer that nutrients are obtained for the growing foetus.

3. **Compact layer**: This is the upper part and consists of closely packed cells and lies next to the uterine cavity.

The blastocyst embeds in this. The spongy layer and the different areas of decidua are identified. According to their relationship to it.

- a. **Basal decidua**: This is the decidua underneath the blastocyst.
- b. **Capsular decidua**: This is the part which covers the blastocyst.
- c. **Decidua Vera**: This is the part which fills the rest of the uterine cavity.

THE TROPHOBLAST

These are the small projection on the blastocyst. These trophoblastocyst cells differentiate into layers. The outer syncytiotrophoblast (syncytium) the inner cytotrophoblast and below this layer mesoderm or primitive mesenchyme.

The Syncytiotrophoblast: This layer is composed of nucleated protoplasm which is capable of breaking down tissue as in the process of controlling.

The Cytotrophoblast: This is a well-defined single layer of cell which produces human chorionic gonadotrophin (HCG). This hormone is responsible for informing the corpus luteum that pregnancy has begun. This will enable the corpus luteum to continue to produce hormones especially progesterone to maintain the integrity of the decidua and prevent shedding or menstruation.

The Mesoderm: These layers consist of loose connective tissue which is similar to the inner cells mass.

THE INNER CELL MASS

While the trophoblast is developing into the placenta, which will nourish the foetus. The inner cell mass is forming the foetus itself. The cells differentiate into three layers. Each layer will form particular parts of the foetus.

1. **The Ectoderm**: This layer mainly forms the skin and nervous system.
2. **The Mesoderm**: This layer forms bones and muscles, the heart and blood vessels, including those in the placenta. All internal organs also originate in the mesoderm.
3. **The Endoderm**: This layer forms mucous membranes and glands.

These three layers together are known as the ***EMBRYONIC PLATE***. Two cavities appear in the inner cell mass one on either side of the embryonic plate.

1. The Amniotic Cavity

2. The Yolk sac

The Embryo: This is the name applied to the developing after implantation and until 8 weeks of conception, from which until further 7 months, the conceptus is known as the ***FOETUS***.

SIMPLE GENERICS, BASIC CHROMOSOMES AND ABNORMALITIES

CHROMOSOMES: Each human cell has a complement of 46 chromosomes arranged in 23 pairs of which two are sex chromosomes. The remainders are Autosomes. The genes give us our heritage from our parents. The characteristics and personalities like the way we talk, sing, the colour of our eyes and height and many others.

During the process of maturation, both gametes shed half their chromosomes. Therefore, before the ovum and the sperm meet to become zygote. The chromosomes divide into 2 parts to form new 23 parts which initiate pregnancy or conception.

SEX DETERMINATION

Females carry two similar sex chromosomes: XX, male carry two dissimilar sex chromosomes: XY.

Each spermatozoa will carry either X or Y chromosome. While as the ovum always carries an X chromosome. If the ovum is fertilized by X-carrying spermatozoa a female is conceived, if by a Y carrying one, a male is conceived.

CHROMOSOMAL ABNORMALITIES

Trisomy 21: A common chromosome disorder, often called Down syndrome, due to an extra chromosome number 21 (Trisomy 21). The chromosome abnormality affects both the physical and intellectual development of the individual.

Monosomy: Existence in a cell of only one instead of normal diploid pair of a particular chromosome.

Turner's syndrome (XO): Turner's syndrome is a condition that affects only girls and women, results when a sex chromosome (the X chromosome) is missing or partially missing. Turner syndrome can cause a variety of medical and developmental problems, including short height, failure to start puberty, infertility, heart defects, and certain learning and social adjustment problems.

Klinefelter's syndrome (XXY): Is a genetic condition that results when a boy is born with an extra copy of the X chromosome. Klinefelter's syndrome is a common genetic condition affecting males.

The Mature Placenta

The placental at term is a round flat mass about 20cm in diameter and 2.5cm thick at its center. It weighs approximately $\frac{1}{6}^{\text{th}}$ of the baby's weight at term. The placenta completely forms and functions 10 weeks after fertilization and normally situated in the upper uterine segment. The placenta has two main surfaces:

Maternal surface: It lies next to the maternal uterine wall. It is dark red colour due to the maternal blood in the outer villus spaces and because part of the basal decidua will have been separated with it. The surface is arranged in about 20 lobes. Separated by each other by grooves known as ***SULCI***.

Foetal surface: It is the part that faces the foetus in utero. It is bluish-grey and has a smooth, shiny surface where the umbilical cord normally inserts at the centre. It is covered by the amnion and blood vessels can be seen from the surface radiating from the insertion of the cord deep into the placenta. After delivery, the amnion can be stripped from the chorion as far as the insertion of the umbilical cord.

The Foetal Sac: The foetal sac consists of double membranes. The outer membrane is the chorion, which lies under the capsular decidua and become closely attached to the uterine wall.

The inner membrane is the amnion, which contains the amniotic fluid.

Chorion: This is a thick, opaque friable membrane derived from the trophoblast. It is continuous with the chorionic plate, which forms the base of the placenta.

Amnion: This is a smooth tough transparent membrane derived from the inner cell mass. It is thought to have a role in the formation of the amniotic fluid (Liquor Amnii).

CIRCULATION THROUGH THE PLACENTAL

Foetal blood low in O_2 is sent to the placenta through the umbilical arteries and transported along their branches to the capillaries of the chorionic villi, where it yields up the CO_2 and absorb O_2 and return via the umbilical vein while the maternal blood is delivered to the placenta bed in the decidua by the spiral arteries and flows into the blood spaces surrounding the villi.

FUNCTION OF THE PLACENTA

- Respiration: O₂ and CO₂ exchange via diffusion.
- Nutrition: Refined/end products.
- Storage: Glucose to glycogen.
- Excretion: Main substance, CO₂, bilirubin.
- Protection against infection.
- Endocrine: HCG, oestrogen.
- Anchoring function.

AMNIOTIC FLUID/LIQUOR AMNII

This is a slightly yellowish fluid contained in the amniotic sac. Its main origin is unknown, but is thought to be from both foetal and maternal. Thus from:

1. Cells of the amnion.
2. Maternal vessels in the decidua and foetal vessels in the placenta.
3. Micturation of the foetus.

Composition/Components of Amniotic Fluid

It is composed of 99% water and 1% solids. The solids include:

1. Proteins
2. Fats
3. Carbohydrates
4. Mineral salt
5. Enzymes
6. Urea
7. Uric acid
8. Bile pigment
9. Vernix caseosa
10. Lanugo
11. Placental hormones

The total amount of amniotic fluid increases throughout pregnancy until 38 weeks gestation when there is about 1 liter which diminishes slightly at term to about 800mls.

Fluid > 1500mls = Polyhydramnios

Fluid < 300mls = Oligohydramnios

FUNCTION OF THE AMNIOTIC FLUID

- Equalizes intrauterine pressure and acts as a shock absorber.
- Allows foetal growth and free movement.
- Prevents adherence to the amnion.
- Maintains constant temperature.
- Protects the foetus from infection as long as it remains intact.
- Re-enforce uterine contractions.
- Helps in the dilatation of the cervical OS during the first stage of labour.
- Provides small amounts of nutrients.

ABNORMALITIES OF PLACENTA

- *Placenta succenturiata*
- *Placenta bipartita*
- *Placenta circumvallata*
- *Placenta velamentosa*
- *Placenta previa*

THE FOETAL SKULL

The foetal skull contains the delicate brain, which is usually subjected to great pressure during birth. The skull is larger than the rest of the body and the

mother's pelvis. Therefore, it is usually the most difficult part to be born whether it comes first or last. An understanding of the landmarks and measurements of the foetal skull enable the midwife to recognize normal and abnormal presentation and positions.

Ossification: The bones of the foetal head originate from two different ways. The face is laid down from a cartilage and is almost completely ossified at birth; the bones of the vault are laid down from membrane and are much flatter and more pliable. They ossify from the centre, outwards and this process is incomplete at birth leaving small gaps which form the sutures and fontanelles. The ossification centre on each bone appears as a boss protuberance. The skull is divided into the **VAULT**, the **BASE** and the **FACE**.

BONES OF THE VAULT

The vault of the foetal skull is made up of seven bones, but five are of obstetric importance.

1. **The Occipital bone:** This lies at the back of the head and forms the region of the occiput. Part of it contributes to the base of the skull as it contains the **foramen magnum**, which protects the spinal cord as it leaves the skull. At the centre is the occipital protuberance.
2. **The Two Parietal bones:** These lie on either side of the skull, the centre of ossification on each side is known as Parietal Eminence
3. **The Two Frontal bones:** They form the forehead (**Sinciput**). At the centre of each bone is the Boss or frontal eminence. The frontal bones fuse to become a single bone by 8 years.
4. **The Two Temporal bones:** These lie on either side of the skull below the parietal bones. Their upper parts forms part of the vault.

SUTURE AND FONTANELLES

These are cranial joints and are formed where two bones adjoin. Whereas, two or more sutures meet

to form a fontanelles. Those of obstetrical importance are discussed below:

1. **The Lambdoidal Suture:** This separates the occipital bone from the two parietal bones.
 2. **The Sagittal Suture:** Lies between the two parietal bones.
 3. **Coronal Suture:** This separates the frontal bones from the parietal bones.
 4. **The Frontal Suture:** Separates the two frontal bones.
-
- ❖ **The Posterior fontanelles or Lambda:** This is situated at the junction of the Lambdoidal and Sagittal sutures. It is small, triangular in shape and can be recognized vaginally because a suture leaves from each of the three angles it normally closes by 6 weeks of age.
 - ❖ **The Anterior fontanelles or Bregma:** This is found at the junction of the Sagittal, coronal and frontal sutures. It is liken to a kite in shape

and recognizable per vaginum because a suture leaves from each of the corners. Measures 3-4cm long and 1.5-2cm wide. Normally closes by the 18th month. Pulsation of cerebral vessels can be felt through it.

REGIONS AND LANDMARKS OF THE FOETAL SKULL

The skull is divided into the vault, the base and the face.

1. **VAULT:** Is the large dome shape part above an imaginary line between the orbital ridges and the nape of the neck. The bones of the vault are slightly pliable and allow for a degree of movement during labour.
2. **BASE:** This is comprised of bones that are firmly united to protect the vital centre in the medulla.
3. **FACE:** This is comprised of 14 small bones which are firmly united and non-compressible.

REGIONS

The Occipital: This is the part in between the foramen magnum and the posterior fontanelles. The part below the occipital protuberance is known as the sub-occipital region.

The Vertex: This is bounded by the posterior fontanelles, the parietal and the anterior fontanelles. Majority of babies are born with head first present by the vertex.

The Sinciput or brow: This extends from the anterior fontanelles and the coronal suture to the orbital ridges.

The Face: The face is small in the new born baby. It extends from the orbital ridge and the roof of the nose to the junction of the chin and the neck.

NOTE: *The point between the eye-brow is known as the GLABELLA*. The chin is also known as the MENTUM and is an important landmark.

DIAMETERS OF THE FOETAL SKULL

The measurements of the skull are important, because the midwife needs practical understanding of the relationship between the foetal head and the mother's pelvis. This is because some diameters are more favourable than others for easy passage through the pelvic canal.

Transverse diameters are two in number:

1. ***Bi-parietal diameter:*** Between the two parietal eminence - 9.5cm
2. ***Bi-temporal diameter:*** It is measured between the two extreme ends of the coronal suture and is 8.2cm.

NOTE: The remaining diameters described here Anterior - Posterior or Longitudinal

1. ***Sub-occipito bregmatic:*** The diameter from below the occipital protuberance to the centre of the anterior fontanelles or bregma (9.5cm).

2. **Sub-occipito-frontal:** The diameter from below the occipital protuberance to the centre of the frontal suture is 10cm.
3. **Occipito-frontal:** The diameter from the occipital protuberance to the glabella (11.5cm).
4. **Mento-vertical:** The diameter from the point of the chin, the neck to the highest point on the vertex (13.5cm).
5. **Sub-mento-vertical:** The diameter from the point where the chin joints the neck to the highest point on the vertex (11.5cm).
6. **Sub-mento-bregmatic:** The diameter from the point where the chin joints the neck to the centre of the bregma is 9.5cm.

ATTITUDE OF THE FOETAL HEAD

The diameter presenting in the individual cephalic or head presentations are as follows:

1. **Vertex Presentation:** When the head is well flexed, the sub-occipito-bregmatic diameter

and the bi-parietal diameter present. These both measures 9.5cm and present in a circular fashion, which is the most favourable shape for dilating vertex.

2. **Brow Presentation:** When the head is partially extended. The mento-vertical diameter (13.5cm) and the bi-temporal diameter (8.2cm) present. If this presentation persist, vaginal delivery is extremely impossible.

3. **Face Presentation:** When the head is completely extended, the presenting diameters are the sub-mento bregmatic (9.5cm) and bi-temporal (8.2cm), the sub-mento-vertical diameter 11.5cm will distend the vaginal orifice.

MOULDING: This is the term applied to the change in the shape of the head that takes place during its passage through the birth canal. This is made possible due to pliable nature of the vault bones.

Importance of Sutures and Fontanelles

- 1.They help in diagnosing attitude and position of the foetal head on vaginal examination during labour.
- 2.They enable some of the bones of the vault to overlap during delivery thus, moulding.
- 3.The fontanelles allow a space for the brain to grow.

FOETAL CIRCULATION

The key to understanding the foetal circulation is the fact that oxygen is derived from the placenta as well as some nutrients and also a site for elimination.

Additional Structures in Foetal Circulation

- 1.Umbilical vein*
- 2.Ductus venosus*
- 3.Foramen ovale*
- 4.Ductus arteriosus*
- 5.Hypogastric arteries*

The umbilical vein carries blood rich in O₂ and nutrients from the placenta to the liver. The

hepatic vein leaves the liver and returns blood to the inferior vena cava. The ductus venosus which is a branch of umbilical vein transmits the greater amount of the oxygenated blood to the inferior vena cava. The blood in the inferior vena then mixed up with the blood from the lower limbs and hepatic vein and pours into the right atrium of the heart. The foramen ovale which is an opening between the atria allows the greater part of the oxygenated blood in the right atrium to pass on to the right atrium. From there, it pass through the mitral valve to the left ventricle and then to the ascending aorta to supply the brains and upper extremities. Therefore, the liver, heart and brain receive the best supply of the newly oxygenated blood.

The superior vena cava returns blood from the head and upper extremities to the right auricle. This with the remainder of the stream brought in by the inferior vena cava passes through the tricuspid valve into the right ventricle. This then supply the non-functioning lung through the pulmonary artery and a greater part of the blood from the right ventricle pass through the ductus arteriosus to the descending aorta to supply the abdomen, pelvis and the lower extremities and the

remaining blood is carried back to the placenta for re-oxygenation through the hypogastric arteries.

CHANGES AT BIRTH

The infant cries and expands his lungs. Causing an increased flow of blood through the four pulmonary veins into the left auricle and equalizes the pressure between the right and left atria. The pressure in the left auricle rises while that in the pulmonary artery falls.

The other structures fibroses and become the following:

- 1. *The umbilical vein - ligamentum teres***
- 2. *Ductus venosus - ligamentum venosum***
- 3. *Ductus arteriosus - ligamentum arteriosum***
- 4. *Foramen ovale - fossa ovale***
- 5. *Hypogastric arteries - obliterated hypogastric arteries***

ANTE-NATAL CARE (ANC)

ANC refers to the care that is given to a pregnant woman from the time the conception is confirmed until the beginning of labour. Focus ante-natal is what is currently practiced.

PHYSIOLOGICAL CHANGES IN NORMAL PREGNANCY

When pregnancy occurs, changes must take place in the body so that pregnancy is carried to term. These changes also bring about the alteration of metabolism, chemical and endocrine balance.

PHYSIOLOGICAL CHANGES THAT OCCUR IN VARIOUS SYSTEMS/ORGANS DURING PREGNANCY

THE VULVA: It becomes blue in colour in response to increase blood supply.

THE VAGINA: It becomes warm with increased secretions and the colour also become purple due to increased blood supply. Pulsation is also felt in the lateral fornices.

THE UTERUS: It enlarges from the 12 weeks onwards and it becomes an abdominal organ. The uterus enlarges at a steady rate and this helps the nurse to determine the period of gestation abdominally.

THE RATE OF GROWTH OF THE UTERUS

8th week (2 months): The uterus is ovoid in shape.

12th week (3 months): It becomes round in shape and at the symphysis pubis rising from the pelvis to become an abdominal organ.

16th week (4 months): It is ovoid and it is felt between the symphysis pubis and umbilicus.

20th week (5 months): The fundus is about 2 fingers below the umbilicus.

24th week (6 months): The fundus can be felt at the level of the umbilicus.

30th week (7½ months): The fundus is midway between umbilicus and the xiphoid sternum.

36th week (9 months): The fundus reaches the xiphoid sternum especially in the primigravidae.

40th week (10 months): The fundus is 3 fingers below the xiphoid sternum because lightening has taken place.

FACTORS WHICH INFLUENCE FUNDAL HEIGHT

- 1. Wrong date*
- 2. Multiple pregnancy*
- 3. Hydraminos (Polyhydraminos or Oligohydraminos)*
- 4. Laxed abdominal muscle*
- 5. Malpresentation (Transverse lie)*

6. A very small single foetus

7. Uterine, ovarian or abdominal growth.

THE CERVIX: It increases slightly in width and becomes softer purplish due to increased blood supply. The cervical glands secrete mucus which forms a plug known as OPERCULUM to seal the cervical canal.

THE OVIDUCT AND OVARIES: They rise with the uterus and the ligaments become shorter and thicker. Ovulation ceases as a result of oestrogens. The fallopian tubes become elongated and rise with the uterus.

THE BREAST: Tingling sensation, enlargement, tension, and tenderness. The nipples become more erect and the areole darkened. Colostrums can be expressed from the breast from the 16th week.

THE SKIN: The linea Alba darkens and referred to as **LINEA NIGRA**, the pregnancy marks – chloasma is seen. All tribal marks and scars become deeply

pigmented due to the action of melanin. The skin of the abdomen, breast and thigh are stretched resulting in small tears in the deeper layer of the dermis causing reddish or bluish lines on the abdomen called ***STRIAE GRAVIDARUM*** (Stretched Marks).

THE BLADDER: It becomes irritable due to pressure from the gravid uterus or presenting part, therefore, there is frequency of Micturation in both early and late pregnancy.

WEIGHT GAIN: By the end of pregnancy, the woman should have gained a total average between 11.5kg – 16kg (25-30lb).

BLOOD CHANGES: There is increase blood volume due to ***haemodilution*** (there is an increased blood plasma and decreased red blood cells). The physiological increase in blood volume causes physiological anaemia in pregnancy.

HORMONAL CHANGES

- ***Progesterone***: initially produced by corpus luteum and after the 12 weeks of pregnancy by placenta.
- ***Oestrogen***: The same as above.
- ***Relaxin***: It causes relaxation of the pelvic ligaments and joints.
- ***Human Chorionic Gonadotrophin Hormone (HCG)***: It is produced by the cells of the trophoblast layer of the placenta. The amount reaches its maximum at about the 12 weeks of pregnancy. It is excreted in urine as early as the 14th week.
- ***The Skeleton***: The hormones oestrogen, progesterone and relaxin cause relaxation and weakening of joints and ligaments resulting in posture and gait.
- ***The Lungs***: There is upward displacement of the lungs by the growing uterus resulting in breathlessness especially in the last trimester (36 weeks).

SIGNS AND SYMPTOMS OF PREGNANCY

The signs and symptoms of pregnancy are often enough to cause a woman to suspect pregnancy. When a woman becomes pregnant, it reveals certain signs and symptoms which may have relation with other conditions or side effects of drugs use these are referred to as ***PRESUMPTIVE*** and ***PROBABLE*** signs while some of these signs are caused only by pregnancy and are known as ***Positive Signs***.

PRESUMPTIVE SIGNS AND SYMPTOMS

- Amenorrhoea
- Morning sickness
- Breast changes
- Bladder irritation
- Skin changes
- Abdominal enlargement
- Quickening

THE PROBLEM SIGNS

Hager's Sign: The softness of the Isthmus which is marked at the 6th to 12th week period of gestation, which is done to establish the age of gestation. Two fingers are placed into the anterior fornix of the vagina and other hand is placed behind the uterus abdominally. Can also be caused by pelvis tumours.

Jacquemier's Sign (Chadwick's Sign): It is a bluish discoloration of the cervix, vagina and labia caused by the hormone oestrogen. It can be observed as early as 6 – 8 weeks after conception, and its presence is an early sign of pregnancy.

Osiander's Sign (Vaginal sign): It is the increased pulsation felt in the lateral vaginal fornix as result of increased blood supply from the 8th week upwards.

Ballottement (Uterine Sign): Tapping a structure which lies in the fluid such as the foetus in the amniotic sac and in such a way that it rebounds against the examining fingers.

Braxton Hicks Contractions (Palmer's Sign):

These are painless contractions of the uterus from the 16th week of pregnancy.

Presence of HCG: Either in urine or blood, this can be present in hydatidiform mole/choriocarcinoma.

Uterine Souffle: Soft blowing sound heard on auscultation of the pregnant abdomen. This can be due to increased blood flow to the uterus as in large uterine myomas/ovarian tumours.

THE POSITIVE SIGNS OF PREGNANCY

- Foetal heart sounds/beat heard by Doppler ultra-sound/foetal stethoscope
- Foetal parts palpated
- Palpable or visible foetal movement
- Visualization of gestational sac by trans-vaginal/trans-abdominal ultra-sound.
- Visualization of foetus by ultra-sound/x-ray

PRE-NATAL/ANTE-NATAL CARE

Ante-Natal Care: In simple term it is the supervision given to a pregnant woman and the unborn child during pregnancy to ensure a healthy outcome for mothers and their new born babies.

Focus Ante-Natal Care (FANC): It is an individual, client centered, comprehensive care that focus on disease detection rather than risk assessment of pregnant woman. FANC sees every pregnancy as at risk and so seek to identify and treat existing problems.

AIMS AND BENEFITS OF ANTE-NATAL CARE

The aim is to monitor the progress of pregnancy in order to support maternal health and normal foetal development. It is essential that the midwife critically evaluates the physical, psychological and sociological effects of pregnancy on the woman and her family.

The Aims And Benefits Include:

- 1.To develop partnership between pregnant women and their health providers.
- 2.To provide holistic approach to the woman's care.
- 3.To promote awareness of public health issues.
- 4.To provide information to the woman to enable her make informed choices about pregnancy and child birth.
- 5.To help in early identification and treatment of infections such HIV, Syphilis and other STIs.
- 6.To recognize complications during pregnancy and take appropriate action.
- 7.To help the woman and her family in their preparation to meet the delivery or birth.
- 8.To help the woman to make informed choice about methods of infant feeding.
- 9.To help offer family planning counseling on an individual basis.
- 10.Reduction of maternal and infant morbidity and mortality.

ANTE-NATAL CLINIC VISIT SCHEDULE (ONE)

The first visit or initial visit should be as early as pregnancy as possible.

Return Visits:

- Once every month till 7th month
- Once every 2 weeks till the 9th month
- Once every week during the 9th month till labour.

ANTE-NATAL CLINIC VISIT SCHEDULE (TWO)

Visits	Gestational Weeks
1 st	16 weeks
2 nd	20-24 weeks
3 rd	28-30 weeks
4 th	36 weeks

However, the client's general condition determines the frequency of clinic visits. Therefore, a good clinical decision has to be made on each visit.

ANTE-NATAL CLINICAL ACTIVITIES

- 1.Reception and Registration: To this the midwife requires communication technique/skill such as listening skills, fluency, timing, volume and

pitch of the voice. Because a great deal of information can be obtained during the first visit, the midwife therefore need to establish rapport to enable her solicit all necessary information. During this visit, all the other forms of communication should be considered; posture, gait, facial expressions etc.

➤ Establishment of Rapport

- Warmly welcome the woman
- Introduce yourself by name and ask her name
- Speak in the language that she understands if possible and avoid technical/medical words
- Inform her about the sequence of activities and what is expected of her
- Inform her of procedures to be carried out, reasons for that and ask for cooperation.
- Encourage her to ask question and answer appropriately.

➤ Registration: It is then done by collecting patient's name, age, address, occupation and others which is entered into the ante-natal register.

2. COMPREHENSIVE HISTORY TAKING

This comprises the following:

MENSTRUAL HISTORY

An accurate menstrual history is taken to help the midwife determine the Expected Date of Delivery (EDD). These include:

- The first menstrual flow (Menarche) and at what age.
- The length and regulation of the cycle
- The duration and quantity of menstrual flow
- The last menstrual period (LMP)
- The gestational age at booking. Calculation of Expectant Date of Delivery (EDD) using Naegle's Rule
- Note the first day of the month
- Add 7 days to the days of the month
- Add 9 months to the months of the year or subtract 3 months from the month.
- Note the number of days in that particular month, thus whether 28 days, 30 days or 31 days.

Example LMP - 12 - 9 - 97; Example LMP -22 - 7 - 10

Calculation = +7/-3/

+7-+9

EDD 19 - 6 - 98
11

29 - 16 - 12=4 Thu 29-4-

OBSTETRIC HISTORY

This has two parts, present and past obstetric history

- 1.Age <18 or >35 years
- 2.Parity (grand multi-parity > 4 children)
- 3.Still birth/Ectopic pregnancies
- 4.Baby small or large for gestation
- 5.Congenital abnormalities
- 6.Rhesus iso-immunization
- 7.Pregnancy induced HTN
- 8.Terminations of pregnancy for two or more times
- 9.Two or more spontaneous abortions
10. Pre-term labour
11. Cervical Cerclage
12. Previous caesarean/uterine surgical
13. Ante-partum/post partum haemorrhage
14. Multiple pregnancy
15. Exclusive breastfeeding/duration of EBF and total duration of breastfeeding.

16. Family planning type and date discontinued

SOCIAL HISTORY

1. Educational background
2. Occupation
3. Husband education
background/occupation/address
4. Next of kin/address
5. History of alcohol ingestion/smoking
6. Marital status

MENTAL HEALTH

- ✓ History of DVT/pulmonary embolisms
- ✓ Chronic ulcers
- ✓ HTN – hypertension
- ✓ Psychological or psychiatric disorders

FAMILY HISTORY

- ✓ History of genetic diseases. Example; SCD, HTN, G6PD

- ✓ Familial/ethnicity
- ✓ Multiple pregnancies
- ✓ History of HTN/DM
- ✓ History of Hepatitis B

MEDICAL AND SURGICAL HISTORY

- ✓ Urinary stasis and reflux
- ✓ Condition such as Asthma, epilepsy, infections and psychiatric disorders are conditions that may require continuous treatment during pregnancy.
- ✓ Musculoskeletal operations fractures of the pelvis or femur

3. OBSERVATIONS AND PHYSICAL EXAMINATION OF PREGNANT WOMAN

It is important that the atmosphere be made friendly to enable the midwife or doctor examine the pregnant woman, especially the primigravidae. In the ante-natal clinic, if it's arranged properly. This will help the attending nurse to detect any deformity of the woman such as stunted growth.

THE HEIGHT: This is taken on the first visit only. Short women have small pelvis while tall women have adequate pelvis. Any woman below 1.5cm may have a contracted pelvis.

THE BLOOD PRESSURE: The blood pressure taken on each visits is very significant because a rise denotes P.I.H during the second trimester. The pulse is taken alongside the blood pressure.

THE WEIGHT: The weight is also taken during visit to determine if the pregnancy is progressing normally (12kg weight increase in pregnant state).

PHYSICAL EXAMINATION OF THE PREGNANT WOMAN

HEAD: Examination of the woman should start from to toe. The hair is examined for dirt and lies. The face is examined for chloasma and pallor as well as puffiness. It is also important to note the facial expression of the woman.

EYES: Conjunctiva is examined for pallor, sclera discoloration-denotes jaundice, and eyelids should be examined for oedema and discharges.

NOSE AND EARS: Inspect these for any abnormal discharge.

MOUTH: Observe tongue and lips for pallor as in anaemia as well as coating and soreness, teeth for dental caries.

NECK: Examined for enlarged lymph nodes and enlargement of the thyroid gland.

BREAST: Examined for signs of pregnancy, thus primary and secondary areola and Montgomery's tubercles inspect for any abnormalities that may affect breastfeeding thus flat, inverted, depressed or cracked nipples. Palpate breast for lymph, pain or any discharge. Teach woman how to do self-breast examination.

ARMS: Examined for equality and oedema which can be seen by tightness of ring. Also inspect palm and nail beds for pallor.

BACK: Assist client into left lateral position and examine back for deformities in the vertebral column and the sacral region for oedema.

ABDOMEN: Inspect abdomen, particularly for size, shape and operation scars.

VULVA: Examined for vulva warts, abnormal discharges, varicose veins and scars from previous episiotomy or clitoridectomy. Any abnormal discharge including blood should be investigated and treated.

LEGS: It should be examined for varicose veins and oedema of the ankles as well as its equality and size which may affect the size of the pelvis.

Thank client, explain findings, report and record all findings.

ABDOMINAL EXAMINATION

This is the assessment of foetal maturity, position, presentation and general condition through the abdominal wall.

PREPARATION OF THE CLIENT

The health assistant should help the client by:

- Explaining procedure to the client and encourage her to empty the bladder
- Provide privacy and assist client to undress
- Assist client onto the couch into a dorsal position with a pillow and her arms relaxed by her sides
- Drape client from the level of symphysis pubis to the feet exposing only the abdomen
- Examination is then carried out systematically by the midwife.

The abdominal examination is divided into three parts

INSPECTION: This is observing the abdomen to determine changes and abnormalities that may occur during the pregnancy.

Physically, the abdomen should be examined for:

- Shape: It should be longitudinal ovoid.
- Size: The size should correspond with gestation age.
- Skin changes: Linea nigra and striae Gravidarum should be noted.
- Scars: Scars on the abdomen should be noted and the mid-wife ask question about them.
- Foetal movement: This should be noted to ensure foetus is alive.

PALPATION

The hands should be washed and made warm so as to prevent stimulation of uterine contractions which produce pain during palpation.

Abdominal palpation has three forms:

- The Fundal palpation which is first helps to identify the fundal height or gestational age and the part of the foetus in the upper pole of the uterus.
- The lateral palpation helps to determine the back, attitude and position of the foetus.
- Pelvic palpation is done to denote the presenting part of the foetus, descent and engagement of the head as well as the position of the foetus.

AUSCULTATION

The use of foetal stethoscope (pinards) to listen to the foetal heart rate. It indicates if the foetus is alive and it should be listened to frequently.

Normal rate is 120 - 140bpm. This is best heard when the stethoscope is place the back of the foetus.

4. ROUTINE INVESTIGATIONS DURING PREGNANCY

These investigations should be carried out on every pregnant woman who visits the ante-natal clinic.

- Haemoglobin for the detection of anaemia (Hb less than 10g or 11.5g).
- Sickling test for vulnerability to anaemia.
- Hb – Electrophoresis for sickle genotype.
- Blood group for possible blood transfusion.
- Rhesus factor for rhesus iso-immunization.
- HBsAg for precaution during delivery to prevent viral infection.
- HIV status for precaution during delivery to prevent cross infection.
- Urinalysis – for detection of protein and glucose.
- Stool R/E – for worms detection.
- Ultra sound
- VDRL (Venereal Disease Research Laboratory) – for STIs.

ROUTINE DRUGS GIVEN AT ANC

- Tablets Ferrous Sulphate (Fersolate).
- Tablet Folic Acid.

- Tablet Multi-vitamin.
- Calcium Tablets.
- Sulphadoxine Pyrimethamine Tablets.
- Tetanol Toxoid injection (Tetanus).

HEALTH EDUCATION OF PREGNANT WOMEN

Health education in pregnancy is geared towards the specific need of the client. The following are some of the topics discussed during the education.

NUTRITION IN PREGNANCY: Nutrition is very important in the life of every pregnant woman. The pregnant woman is exposed to gain 12kg due to physiological changes. A pregnant woman requires a balance/adequate diet.

1. Protein
2. Carbohydrates
3. Lipids
4. Minerals
5. Vitamins
6. Water (fluids)

Vitamins and Minerals

1. **Iron** – Essential for HB

Sources

- ✓ Liver
- ✓ Okro
- ✓ Leafy vegetables
- ✓ Kidneys
- ✓ Eggs

2. **Calcium** – For foetal bone formation and ossification of skeleton.

Sources

- ✓ Milk and Milk products
- ✓ Leafy vegetables
- ✓ Fruits
- ✓ Bones
- ✓ Fish eaten whole

3. **Vitamin B12 and Folic acid** – for development of blood cells in the bone marrow.

Sources

- ✓ Wheat and wheat products

- ✓ Brown rice for vitamin B12

4. **Vitamin C** – for iron absorption and infection prevention

Sources

- ✓ Citric fruits

5. **Vitamin D**

Sources

- ✓ Bones
- ✓ Milk and milk products

6. **Vitamin K** – for clotting of blood

Sources

- ✓ Liver
- ✓ Leafy vegetable
- ✓ Plantain

7. **Protein**

For tissue building, foetus brain cells, placenta, uterus, breast and blood volume.

Sources

- ✓ Meat

- ✓ Fish
- ✓ Beans
- ✓ Egg

8. Lipids

Provide vitamin A and D and energy.

Sources

- ✓ Fats and Oils

9. Carbohydrates

Provides energy

Sources

- ✓ Cassava
- ✓ Plantain
- ✓ Yam

FACTORS TO CONSIDER WHEN EDUCATING ON DIET

- ✓ The age of the pregnant woman. Example younger than 16 years.
- ✓ The socio-economic background of the woman.
- ✓ Special diet due to medical condition.

- ✓ Clients who were below ideal body weight.
- ✓ Social lifestyles of the woman.
- ✓ A woman concern of her diet/body mass.
- ✓ Geographical location.
- ✓ Vegetarians

PERSONAL/ENVIRONMENTAL HYGIENE

Encourage the following:

- ✓ Clean well ventilated house.
- ✓ Clear surrounding of weeds.
- ✓ Bowel care.
- ✓ Hair and nail care.
- ✓ Bathing twice daily.
- ✓ Neat loose clothing.
- ✓ Perineal care.

FACTORS AFFECTING PERSONAL HYGIENE

- ✓ Cultural/religious
- ✓ Developmental stage
- ✓ Mobility
- ✓ Emotional

- ✓ Physical illness
- ✓ Personal preference

BIRTH PREPAREDNESS/COMPLICATION READINESS

- ✓ Items to gather towards birth, these may include; baby dress, sponge, soap, towel, dettol, pad and many others.
- ✓ Transportation to the clinic
- ✓ Family to accompany to facility
- ✓ Readiness for intra/post – partum complication. Example is blood transfusion readiness.

MINOR DISORDERS IN PREGNANCY

These are minor conditions that mostly do not endanger the life of the pregnant woman or developing fetus, but must be treated to minimize the discomfort and prevent complication.

1. **Morning sickness:** Nausea and vomiting are said to affect over 80% of pregnancies. The exact cause is not known but it is said to be

due to hormonal changes. The actual cause is not known but is said to be due to hormonal changes.

Advice/Treatment

Reassure client and explain condition to her.

- ✓ Encourage dry biscuit or crackers with a cup of tea before rising from bed.
- ✓ Encourage client to avoid stimuli that cause vomiting, example; spice, pungent odour and others.
- ✓ Encourage client to eat small but frequent meals.
- ✓ Acupuncture, homoeopathic and herbal medicine could be used as complementary remedies.
- ✓ Advice client to get out of bed slowly, sit on the bed for some time before getting up.
- ✓ Chewing stick can also help.

NOTE: *Hyperemesis Gravidarum which will need the care of a specialist.*

2. **CONSTIPATION:** It is very common due to progesterone action on plain muscles and also as a result of pressure from the gravid uterus on the rectum causing incomplete or infrequent action of the bowel and consequently filling of hard faeces.

Advice/Treatment

- ✓ Encourage frequent intake of fluid and do good exercise as tolerated.
- ✓ Encourage woman to avoid stimuli that cause vomiting. Example; spice, pungent odour.
- ✓ Eat enough vegetables and fruits for fibre.
- ✓ Encourage regular emptying of bowel.
- ✓ Mild laxative could be used, example; Senna/Dulcolax.
- ✓ Advice against enema – may lead to abortion.

Complication: Haemorrhoids

3. **Backache:** This is possibly caused by bad posture, pendulous abdomen, relaxed muscles, and referred pain from constipation or haemorrhoids.

Advice/Treatment

- ✓ Reassurance and explain changes in centre of gravity and posture to adapt. Example; supporting back with pillows when sitting.
- ✓ Advice to avoid lifting heavy objects.
- ✓ Use of pillows to support the knee and abdomen when sleeping.
- ✓ Application of warm compresses to improve circulation.
- ✓ Physiotherapy if available.
- ✓ Give prescribed analgesics.

4. **Heartburns (pyrosis):** This is due to the action of progesterone which causes relaxation of the cardiac sphincter resulting in reflux of the stomach content especially if the client assumes a recumbent position.

Advice/Treatment

- ✓ Reassure client.
- ✓ Client to sit up for some time after meals.
- ✓ Sleep with extra pillows to support back.
- ✓ Avoid fatty and spicy foods.
- ✓ Sucking of pepper-mint and sips of milk.
- ✓ Antacids like Magnesium Trisilicate and milk magnesia in stubborn cases.

- ✓ Eat little at frequent intervals to avoid distension of abdomen.

5. **Varicose vein:** This occurs in some pregnant women, progesterone cause relaxation of the veins/valves leading to the development of this condition. It usually disappears after delivery but may recur in subsequent pregnancies in a worse form.

Advice/Treatment

- ✓ Avoid standing for long hours.
- ✓ Remove tight bands and bead around waist.
- ✓ Raise feet when sitting and pillow when lying.
- ✓ Wear elastic stockings or crepe bandage may be used.
- ✓ Encourage calf muscle exercise by rising onto the toes and making circular movements with the ankle.
- ✓ For vulva varicose veins, apply a firm perineal pad or use soft pillows when sitting.

DANGER SIGNS IN PREGNANCY

The pregnant woman is to seek medical care immediately if she experiences any of these signs or symptoms.

1. Sudden gushing of fluid/rupture of membranes.
2. Continuous/persistent nausea and vomiting.
3. Oedema of the eyes, face and feet especially in the morning.
4. Slight bleeding from the vagina.
5. Change in patterns of foetal movement.
6. Blurred vision/double vision.
7. Epigastric/abdominal pains.
8. Severe frontal headache.
9. Severe anaemia noted by pale conjunctiva, whitish tongue and dizziness.

RISK FACTORS IN PREGNANCY

1. Foetal movement pattern reduced.
2. Haemoglobin lower than 10g.
3. Poor weight (gain/loss).
4. Protein, glycosuria, bacilluria.
5. Blood pressure greater than 140/90mmHg.
6. Uterus large or small for gestation.
7. Excess or decrease liquor.
8. Malpresentation.
9. Head not engaged in primigravidae at term.

10. Any vaginal, cervical or uterine bleeding.
11. Premature labour.
12. Infection.
13. Chronic or acute illness or disease in the woman.
14. Relevant sociological or psychological factors.

INTRA-PARTUM CARE

This is the care given to women throughout the period of labour.

LABOUR

It is the process by which the foetus, placenta and membranes are expelled from the birth canal after the 28th week of gestation. It can also be “the onset of painful, regular, rhythmic uterine contractions and the expulsion of the foetus, placenta and membranes through the birth canal”.

CRITERIA FOR EUTOCIA/NORMAL LABOUR

Labour is said to be normal:

- When the foetus is born at term (37 weeks – 40 weeks).
- When the foetus presents with vertex.
- When the process is completely spontaneous without any assistance.
- When the labour completes within 18 hours.
- When the labour completes without any complications.

SIGNS AND SYMPTOMS OF TRUE LABOUR

These are signs which should prompt the pregnant woman that labour is due:

- Rhythmic painful uterine contractions, increasing in strength and regularity.
- Dilatation of the cervical OS.
- ‘Show’ – a bloody mucoid vaginal discharge.

PRE-MONITORING/PRE-LABOUR SIGNS

- Lightening.

- Frequent Micturation.
- False labour (irregular false contractions that lasts longer than one minute).
- Taking of the cervix/Effacement of the cervix.

STAGES OF LABOUR

The stages of labor are four. The woman must go through all this stages in order to have a normal labour. The duration of normal labour as defined by World Health Organization (WHO) within the hour of eighteen for primipara.

- 1.FIRST STAGE: This stage begins when the uterine contractions become regular and rhythmic until the cervical OS is fully dilated.
- 2.SECOND STAGE: The second stage is that of expulsion of the foetus. It commences when the cervix is fully dilated and the woman feels the urge to expel the baby. It is complete when the baby is born.
- 3.THIRD STAGE: It is the stage of separation and expulsion of the placenta and membranes and

subsequent control of bleeding. It lasts from the birth of the foetus/baby until the placenta and membranes are expelled and bleeding is controlled.

4.FOUR STAGE: This is the immediate post-partum where the mother and baby are observed closely. It is the first six hours following birth. This stage begins the lying-in period.

PHYSIOLOGY OF THE FIRST STAGE OF LABOUR

Before the onset of labour, the pregnant woman may experience painless contraction known as ***BRAXTON HICKS*** which is not a true sign. The first stage of labour is characterized by the following:

- 1.Contraction and retraction of the uterine muscles: In true labour, the woman experience painful contraction in the sacral region and lower abdomen. The contractions have a particular rhythm and increases in strength duration as labour progresses. The contractions

make the fundus harder. Reduces the uterine cavity while retraction retains muscle fibres after contractions causing the dilatation and expulsion of the foetus. (The harmonious working relationship between the two segments thus the upper and lower uterine segments are referred to as ***POLARITY OF THE UTERUS.***

2. The demarcation that forms between the two segments of the uterus thus the upper and lower is known as RETRACTION RING. This is normal in pregnancy; it should however not be seen/felt on the abdomen. However, if this happens then it becomes abnormal and is referred to as ***BANDI'S RING.***
3. "SHOW": This is when the cervical operculum is dislodged as a result of cervical dilatation and is mixed up with blood from the cervical capillaries.
4. FORMATION OF THE FORE WATERS: As the cervix dilates, the membranes in front of the presenting part removed from the uterine wall containing some liquor Amnii which forms a bag of water known as ***BAG OF FORE WATER.***

The liquor and membranes behind the presenting part is known as ***BAG OF HIND WATER.***

- In vertex presentation, the fore water is cone-shaped.
 - In abnormal presentation the fore water is sausage-shaped.
5. Rupture of membrane: This should occur towards the end of the first stage at full dilatation of cervix. The continuous pressure on the hind and fore water causes the rupture.
6. Dilatation of the cervix: Polarity of the uterus causes the dilatation of the cervix which begins with the size of one finger full dilatation of 10cm and the presenting part is felt.

THE PHYSIOLOGY OF THE SECOND STAGE

There is further descent of the baby from the birth canal when the cervix is fully dilated; the baby is expelled at this stage.

SIGNS AND SYMPTOMS OF THE SECOND STAGE

- Contractions increase in intensity and frequency and the woman feels the urge to push as the foetal head presses on the rectum which may cause expulsion of faecal matter.
- The perineum bulges becoming thinner and longer because the posterior segment gets pushed backwards and forward and the perineal body is flattened out.
- The anus dilates in “D” shape due to the exposure of the anterior wall of the rectum.
- The vulva gapes when the legs are parted.
- No cervix is felt on vaginal examination and the birth of the baby takes place.

PHYSIOLOGY OF THIRD STAGE OF LABOUR

This commences after birth of the baby.

Physiologically, it is manifested as follows:

- ✓ Physiological rest.
- ✓ Return of the uterine contractions.
- ✓ Separation of the placenta from the upper to the lower segment.
- ✓ Expulsion and descent of the placental membranes from the birth canal.

- ✓ Control of bleeding.

SEPARATION OF THE PLACENTA

The unique characteristics of uterine muscle lie in its power of retraction. This takes place as the spongy layer of the decidua sheds off along the perforated layer of the uterine wall, with each contraction exposing the open maternal blood vessels and sinuses so that bleeding occurs which clots and forms RETRO-PLACENTAL CLOT.

As the contraction continues and the uterine cavity becomes smaller in size, the placenta slips off by its own weight into the lower segment through the hole in the amniotic sac peeling off the membranes from the uterine wall and then expelled per vagina.

The expulsion takes place in two forms:

1. The SCHULTZE'S METHOD middle separation
2. The MATHEW DUNCAN'S METHOD edge separation

S/S PLACENTA DESCENT/SEPARATION

- ✓ Elongation of the cord.

- ✓ Sudden gush of blood and liquor.
- ✓ The uterus feels harder, smaller and mobile.
- ✓ Palpable uterus at the umbilicus.
- ✓ The presence of the placenta at the vulva.

METHOD OF PLACENTAL DELIVERY

- By controlled cord traction (mostly used).
- By counter traction

MECHANISM OF NORMAL LABOUR

1. DESCENT: Caused by contraction and retraction of uterine muscles.
2. INCREASED FLEXION: Caused by resistance of the pelvic floor muscles.
3. INTERNAL ROTATION: The rotation of presenting. ex

